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APRIL 1989
VOLUME 7, NUMBER 12

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The ATARI® Resource



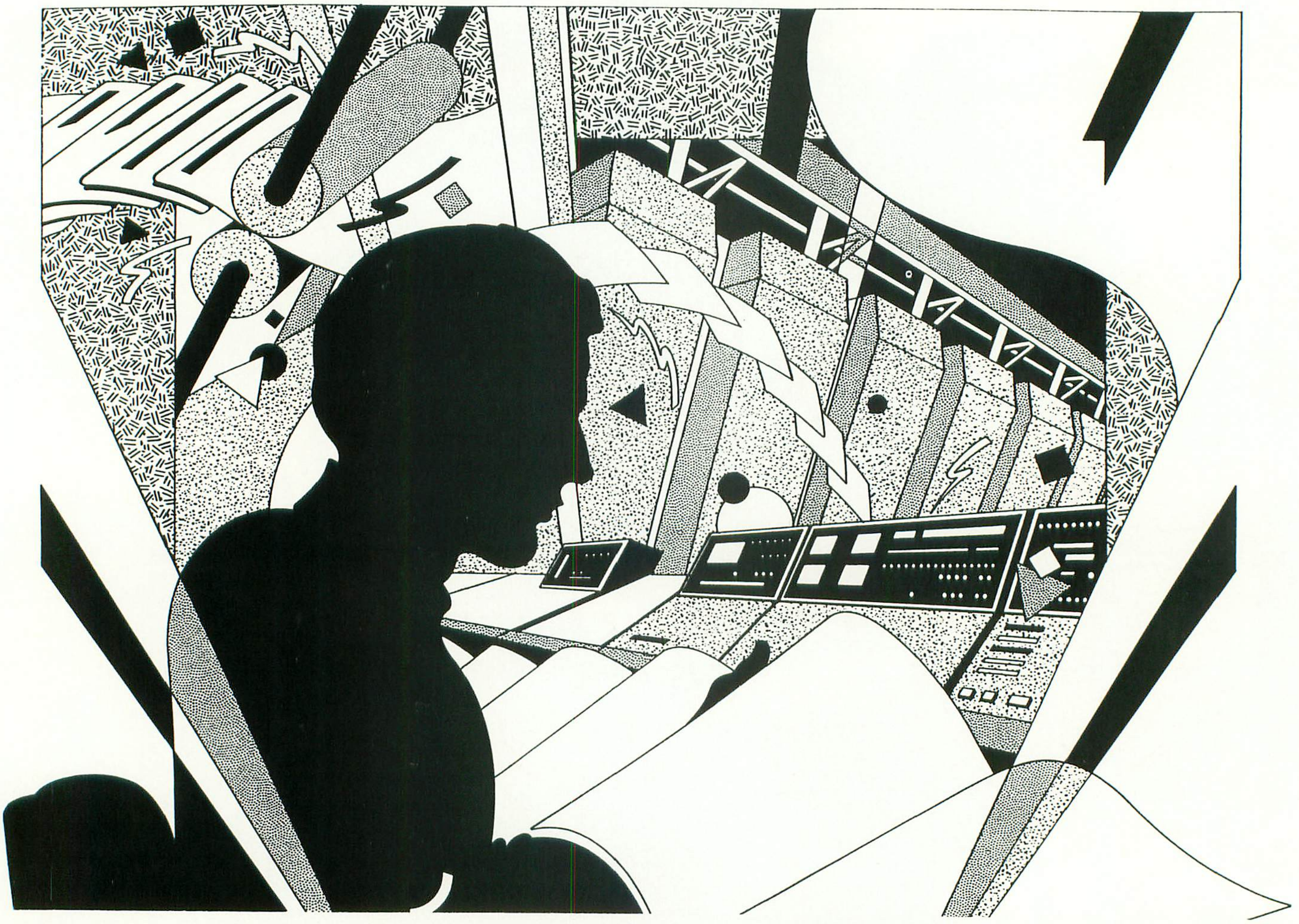
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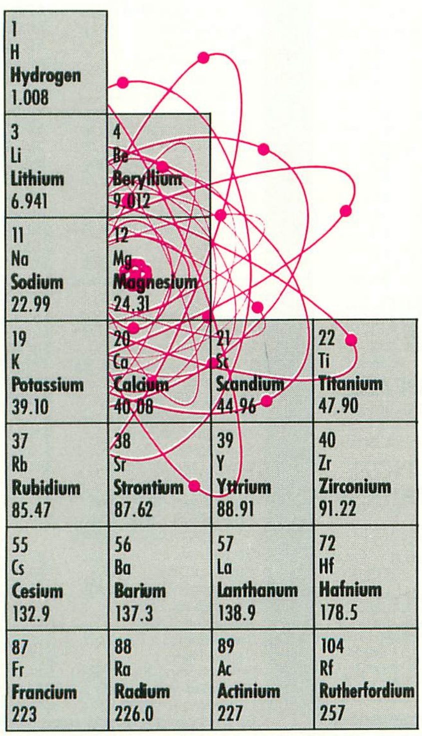
'88 IRS Spreadsheet
See page 22

Antic

The ATARI® Resource



Adventure Works. Page 28



Periodic Madness. Page 8

FEATURES

APRIL 1989, VOL. 7, NO. 12

DEPARTMENTS

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EDITORIAL



The following letter from a concerned **Antic** reader in Alaska says it all:

	MAY 1986	*NOVEMBER 1988*
Advertisers	69	19
Pages	*146*	*80*
I/O & HELP Items	*11*	*7*
Type-In Listings	*10*	*6*
Cover Price	*$ 3.50*	*$ 3.95*
Disk Subscription	*$99.95*	$59.95

Antic quality remains good, but I worry. Reduced size is not all explained by eliminating ST coverage. Good luck,

Ken S.
Anchorage, Alaska

The Atari community also knows very well that **Antic** Magazine remains one of the prime sources of dependable support for the 8-bit line. In recent months, **Antic** greatly expanded the 8-bit Arcade Catalog of hard-to-find software and also established a complete index/library of back issues on CompuServe's ANTIC ONLINE. While others may drop out of the Atari 8-bit market, **Antic** is still finding new ways to serve your needs.

Antic is a business venture that must continue to pay for itself, and we now rely almost exclusively on the support of readers like you—serious Atari 8-bit users who see no reason to abandon your investment in the best 64K personal computer ever made.

Sure, lower advertising revenues have forced some reduction in the size of **Antic** Magazine (although most of the pages cut were ads anyway, not editorial). But each month, both sides of the Antic Disk continue to be packed as full as ever. In fact, the monthly Antic Disk is a better value than ever before—because hobbyist programming for the Atari 8-bit has become much more sophisticated, requiring listings that are far too large and tricky to be printed as type-ins.

COMING HITS

Antic's bank of accepted programs waiting for publication is now filled with outstanding professional-quality Super Disk Bonus titles that you'll be getting in coming months. These major programs include a powerful new desktop publisher, an advanced chemistry tutor, a smart RAMdisk handler, a Player/Missile designer in assembly language, a screen printer for Lode Runner, an I-Ching oracle and some of the hottest assembly language games you've ever seen.

So subscribe now to the **Antic** Magazine/Disk combination! It's the most important $59.95 you can spend to keep **Antic**—and your trusty 8-bit Atari—working for you.

Nat Friedland

Nat Friedland
Editor, **Antic**

PRESIDENTIAL UPDATE

With the recent election, readers using **Antic's** copyrighted *Name the Presidents* (October 1987) will want to update the program to include President Bush. They need to add the following lines:

```
115 DIM A$(20):TL=41:G=0
930 DATA 41,GEORGE,CVTI
940 DATA 0,END,END
```

I also invite anybody interested in finding out about the Educators' Atari Club and our large public domain library to write us at P.O. Box 1024, Laytonville, CA 95454.

Peter Loeser
President, EAC
Laytonville, CA

ANTIC MUSIC PROCESSOR

I would be willing to say that Antic Music Processor (December 1988, Super Disk Bonus) is your best program of the year, but I have a few questions. First, how do you input lyrics? Also, could you please print the file structure of a saved AMP music file? I would like to write a listing program so I could view the "sheet" of music in its entirety, not just a few lines at a time.

Jay Moore

There currently is no simple way to include lyrics in AMP. For the COMESAIL sample, the author actually went into the data file to add the lyrics the hard way. Unfortunately, that information was unclear in the article. Author Steven Lashower is currently working on a lyric editor for AMP, and as soon as it's available we plan to run it in the magazine. At present, Lashower is the only person who understands the structure of the saved files, but we're passing your excellent idea on to him.

***Antic** must apologize to would-be contest entrants who were frustrated by their inability to enter lyrics. If you have any lyric-less songs you're proud of, we'd still be glad to look at them and possibly run some on disk in the future.*—ANTIC ED

ANTIC DATA-X, REVISION B

Thanks for the Revision B version of the *Antic Data-X* database (December 1988.) I was impressed with the original and think this is a nice improvement. I happily translated my inventory databases right away. (It did take a *very* long time and I thought that perhaps an error had occurred.)

I do have a question about the program, however. When loading the program with BASIC on my 800XL I get an error message in German, with options for "DOS, RUN, ODER LOAD?" (the D, R, L are in inverse.) Typing "R" gets to the friendly database menu. But when I have my Revision C BASIC cartridge stuck in, I get a garbage screen and lock up.

So what is the German menu doing there? Whatever, I do like the program and greatly enjoyed the December issue of Antic, particularly the Antic Music Processor!

Richard Williams
Pullman, WA

Antic Data-X is written in Turbo BASIC, a programming language developed in Germany. This database program is a run-time version, so you don't need BASIC and should boot the disk without a language cartridge, or holding the [OPTION] key down for an XL/XE. The "FEHLER—2 IN ZEILE 10011 ($6E69)" you got is simply an error message going back to its roots.—ANTIC ED

BEGINNERS HELP

I just got a used Atari 800XL with a 1050 disk drive and 1030 modem. I got a few diskettes and cartridges, too. My problem is that I don't understand how to use it. I have the Atari owner's manuals. I bought the December 1988 **Antic** and read the whole thing. But I still don't understand what to do with the disk. Could you please print some articles for people like me?

Mrs. Fred Towse
Hot Springs, AR

*For a complete beginner like yourself, **Antic's** First-Time Atari Users Handbook (February 1988) can be very helpful. This article will take you step-by-step through the process of setting up the computer, video (TV) and disk drives. Then using your disk with DOS is discussed.*
—ANTIC ED

FANCY GRAPHIC OS

Lately I've seen some ads for ST GEM-like operating environments for 8-bit Ataris, products like Diamond OS, GOE Desktop, Lightspeed Windows, and Screens. I've seen the ST-like environment used in the game OGRE and it's outstanding! How do these products stack up? Why doesn't **Antic** do an in-depth article on these products?

Capt. John Glessner
Kirtland AFB, NM

Frankly, we're waiting to see the cartridge-based *versions of some of these systems before we make a final judgement. As it is, the disk-based versions we've seen take up more memory than is practical for most applications on a standard-memory Atari, a problem that could hopefully be solved using cartridges.*
—ANTIC ED

TOO BUSY LIGHT

Why do the 1050 disk drives keep spinning the disk for ten seconds after the drive has finished accessing the disk? (That's how long it seems I have to wait for the busy light to go out, anyway.)

Steven White
Harlingen, TX

Believe it or not, the 1050 is trying *to be helpful. Physically, it takes a long time for the 1050 to get into position for disk I/O. A built-in function was added to keep the 1050 in ready position a little longer than necessary, just in case your program wants to do more with the disk. Of course, if you just want to remove the disk and go on to something else, the wait is more annoying than useful.*—ANTIC ED

ERRATIC MODEM?

I am looking for a 2400 baud modem, so I was happy to see **Antic** review the Worldport 2400 modem in your December 1988 issue. However, the review left me confused. It seems the modem only worked properly for six days, after which it would only work when cool, or at half speed. Yet you consider such a modem to be "dependable, versatile and powerful. . .just as reliable as any standard-sized modem." Why?

I have a used 1200 baud Rixon modem that has worked hundreds of hours, with no problems whatsoever, no matter the time of day or how warm it was. Either something got edited from that review, or I will not trust any of your hardware reviews anymore!

Paul Muehlbauer
New Ulm, MN

The Worldport ran non-stop, *batch-uploading huge text files ten hours a day. This is unusually rough treatment for a modem, since the constant transmission of data meant the modem was working every second. Our reviewer, Technical and Online editor Charles Jackson, felt it was the cumulative effect of working without rest that caused problems. Unless you're running a very popular bulletin board, you're not likely to put that sort of constant pressure on a modem. Overall, our reviewer was very impressed by the Worldport, but wanted to give you all the facts.*—ANTIC ED

***Antic** welcomes your feedback, but we regret that the large volume of mail makes it impossible for the Editors to reply to everyone. Although we do respond to as much reader correspondence as time permits, our highest priority must be to publish I/O answers to questions that are meaningful to a substantial number of readers.*

Send letters to: Antic I/O Board, 544 Second Street, San Francisco, CA 94107.

EDIT8

(sector editor)
Logic One
P.o. Box 18123
Cleveland, OH 44118-0123
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OASIS BBS 4.2

(online software)
Z Innovators
1344 Park St., Dept. 187
Stoughton, MA 02072
$30, requires 2 disk drives and SpartaDOS 3.2D or X.

The newest version of **OASIS BBS** is now out from Z Innovators. Full of external modules, OASIS BBS lets you run a bulletin board complete with survey, callers log, trivia game, an Add-A-BBS number module and three different user listers. Included as an ARC file in the package with OASIS BBS 4.2 is OASIS.PAL, a programming aid package.

This disk-based BBS requires at least two floppy drives and SpartaDOS 3.2D or the SpartaDOS X cartridge. (A fully-functional public domain version, OASIS JR, is also available.)

Future updates to OASIS are in the works, including free updates of the current version, and late in 1989 a completely new version 5. Features planned include built-in ANSI color, YMODEM batch protocol, and a file search module that will include descriptions of files. Message bases will be enhanced with message thread options and an external networking module for the exchange of new messages.

ESCAPE FROM PLANET X

(text adventure)
Covox Inc.
675-D Conger Street
Eugene, OR 97402
(503) 342-1271
$19.95, 48K disk

Use your Covox Voice Master or Voice Master Jr. to train your computer to recognize your voice alone—then play **Escape From Planet X**, the new voice-controlled text-adventure from Covox. The game is included with the Voice Master Jr. for $49.95 and is also available separately for $19.95.

Escape from the Human Research Lab of mad Professor Schism, and then survive the dangers of Planet X, including ocelots, swivel chairs, asteroids and symbolic squid. Co-exist with aliens in peace and harmony, or blast them to pieces—it's all up to you.

HAPPY'S MATH

(educational software)
Bensley Consulting
P.O. Box 301
217 West Walnut
Westfield, IL 62474
(217) 967-5465
$19.95, 800XL/130XE

Happy's Programs MATH is an easy-to-use program that drills a user in addition, subtraction, multiplication and division. Options include several levels of difficulty, and a "show work" option that requires users to enter the intermediate steps in working out a multiplication or division problem. If you give an incorrect answer, Division will even display the correct work for you.

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Escape From Dispozon: II

Grand Finale of Antic's Biggest Disk Bonus. Program by Kevin Sherratt



Kate Murphy

When we left you last month, the Antic Disk contained only Part I of Escape From Dispozon. Now, on the entire Side B of this month's Antic Disk you will find the conclusion of the saga—**Antic's** first two-part Super Disk Bonus. So return with us now to that charming "planet-fill" Dispozon, the garbage dump of the galaxy.

NOTE: Without the objects and information you picked up from last month's disk installment, you have no chance to complete the final solution of the adventure. **You need BOTH the March and April 1989 Antic Disks** in order to attain final victory over the perils of Dispozon.

As hapless star-pilot Havilfad, you must find a way to escape the slimy, greasy, junk-filled shores of Dispozon—before you are fatally poisoned by the toxic smog. Winning the game involves finding and refitting an old abandoned spaceship. With your grumpy companion droid Iggy, make your way through rubbish, trash and sewage. Fight off grouchy crabs and fierce amoebas, pick up all sorts of yucky stuff and put up with oodles of abuse from the insufferable Iggy, who expects no end of gratitude from a miserable little worm like you!

Hear your faithful companion Iggy say, "What are you doing, Master? Need I remind you that dying can seriously affect your efficiency rating?" or "The trash wall is four stories high and weighs 9 million tons. Whatever ill-advised plan is fermenting in that sordid little brain of yours had best not include me!"

These thrills and more are all yours, on the March and April Antic Disks. Escape From Dispozon is a *very* large BASIC text adventure—much too large to run on a single side of a disk. We never ran a program this large before, but Escape from Dispozon was too good to pass up.

Start the game by booting Side B of *last month's* March 1989 Antic Disk. Play the game until Iggy says, "Insert the story disk in Drive 1 and press RETURN."

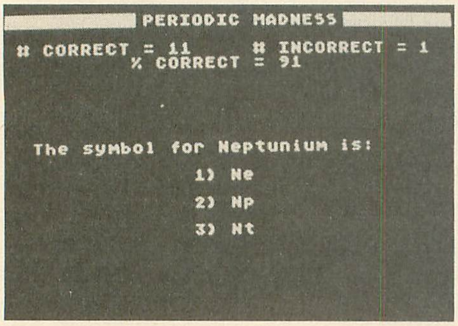
This is your cue to remove the March 1989 Antic Disk and insert Side B of *this month's* Antic Disk. Then press [RETURN] to continue.

Hints for playing Escape From Dispozon and a list of acceptable commands were in a Help file last month on the March 1989 disk. To read the Help file or obtain a printout, select choice 5, HELP.BAS, from the Side A menu.

If you don't have both Antic monthly disks containing Escape From Dispozon, you can order them. Your March and April 1989 Antic Disks will be shipped to you within 24 hours after your order is received. Just phone Toll-Free to the Antic Disk Desk at (800) 234-7001. The monthly disks are only $5.95 each (plus $2 apiece for shipping and handling) on your Visa or MasterCard. Or mail your check to Antic Disk Desk, 544 Second Street, San Francisco, CA 94107.

Periodic Madness

Chemistry tutoring from your Atari. **By Marc LeBeau**



Brush up on the elements and their chemical symbols with this three-part quiz based on the periodic table of the elements. This BASIC program works on 8-bit computers with at least 48K, disk or cassette.

Recent studies have shown that the children of the United States are far behind children in other countries in their knowledge of science. This may become a major problem for us in the next century if something is not done soon. Who will discover new cures for diseases? Who will develop the new materials for the cars, rockets, or even computers of the 21st century?

Periodic Madness may not solve all these problems, but it's a start. By playing with this program, young people can learn about a basic scientific tool while enjoying a challenging game. Chemistry students will find it an excellent way to brush up on the elements and their symbols.

WHY CHEMISTRY?

Chemistry provides a good, general introduction to science. It involves many other disciplines, applying both mathematics and the laws of physics. Chemistry also plays a vital role in the biological sciences—scientists are discovering more and more about the chemical basis of life. From medicines to building materials, chemicals play an important part in our daily lives.

This program has three quizzes based on the periodic table of the elements, one of the first things taught in basic chemistry classes. The periodic table is a primary tool of chemistry, containing a wealth of important information. For example, from the periodic table we can find the symbol used to represent each element.

Most people know that H_2O represents water. Chemistry uses many such formulas to describe the molecules that make up the world around us. These symbols make up a second language that chemists (and other scientists) must understand. Learning to associate "H" with "Hydrogen" is a first step in understanding chemistry.

Another vital piece of information that can be obtained from a periodic table is the atomic mass of each element. Knowing these masses lets chemists calculate how much of a certain element is in a mixture or compound.

GETTING STARTED

Type in listing 1, PERIODIC.BAS, check it with TYPO II and be sure to SAVE a copy before you RUN it.

The program begins by displaying an outline of a periodic table. It will then prompt you for the skill level at which you wish to play. The questions are all multiple choice. Even so, if you're unfamiliar with the periodic table, it would be a good idea to look it over first.

In level one you are given the symbol and must choose the element it stands for. All the answers in level one are actual elements. The only trick questions on this level are those the periodic table provides itself—such as Au for gold, or K for potassium.

Level two goes the opposite way. You are given the element and must choose the correct symbol. Beware: In this section many of the symbols are made up and don't actually represent any elements.

Level three is definitely the hardest. You are given the element's name and must choose (or guess) the correct atomic mass. Even the best chemists will have some trouble with this one! Since the mass is related to the element's position in the table, this will quickly help players learn to visualize the elements' positions in the table.

Questions are presented in random order. Each test will quiz you on *all* the elements. If you miss a question, the program will repeat it until you answer correctly twice.

After you've completed each skill level, you are given a rating based upon the percentage you got right. These ratings range from FANTASTIC to YOU BETTER TRY AGAIN!

Marc LeBeau is a Graduate Assistant at the University of New Haven in Connecticut. With bachelor degrees in both Chemistry and Criminal Justice he is currently working on his masters degree in Criminalistics. This is his first appearance in **Antic**.

Listing on page 38

PERIODIC TABLE OF THE ELEMENTS

1 H **Hydrogen** 1.008																	2 He **Helium** 4.003
3 Li **Lithium** 6.941	4 Be **Beryllium** 9.012											5 B **Boron** 10.81	6 C **Carbon** 12.01	7 N **Nitrogen** 14.01	8 O **Oxygen** 16.00	9 F **Fluorine** 19.00	10 Ne **Neon** 20.18
11 Na **Sodium** 22.99	12 Mg **Magnesium** 24.31											13 Al **Aluminum** 26.98	14 Si **Silicon** 28.09	15 P **Phosphorus** 30.97	16 S **Sulfur** 32.06	17 Cl **Chlorine** 35.45	18 Ar **Argon** 39.95
19 K **Potassium** 39.10	20 Ca **Calcium** 40.08	21 Sc **Scandium** 44.96	22 Ti **Titanium** 47.90	23 V **Vanadium** 50.94	24 Cr **Chromium** 52.00	25 Mn **Manganese** 54.94	26 Fe **Iron** 55.85	27 Co **Cobalt** 58.93	28 Ni **Nickel** 58.71	29 Cu **Copper** 63.55	30 Zn **Zinc** 65.38	31 Ga **Gallium** 69.72	32 Ge **Germanium** 72.59	33 As **Arsenic** 74.92	34 Se **Selenium** 78.96	35 Br **Bromine** 79.90	36 Kr **Krypton** 83.80
37 Rb **Rubidium** 85.47	38 Sr **Strontium** 87.62	39 Y **Yttrium** 88.91	40 Zr **Zirconium** 91.22	41 Nb **Niobium** 92.91	42 Mo **Molybdenum** 95.94	43 Tc **Technetium** 98.91	44 Ru **Ruthenium** 101.1	45 Rh **Rhodium** 102.9	46 Pd **Palladium** 106.4	47 Ag **Silver** 107.9	48 Cd **Cadmium** 112.4	49 In **Indium** 114.8	50 Sn **Tin** 118.7	51 Sb **Antimony** 121.8	52 Te **Tellurium** 127.6	53 I **Iodine** 126.9	54 Xe **Xenon** 131.3
55 Cs **Cesium** 132.9	56 Ba **Barium** 137.3	57 La **Lanthanum** 138.9	72 Hf **Hafnium** 178.5	73 Ta **Tantalum** 180.9	74 W **Tungsten** 183.9	75 Re **Rhenium** 186.2	76 Os **Osmium** 190.2	77 Ir **Iridium** 192.2	78 Pt **Platinum** 195.1	79 Au **Gold** 197.0	80 Hg **Mercury** 200.6	81 Tl **Thallium** 204.4	82 Pb **Lead** 207.2	83 Bi **Bismuth** 209.0	84 Po **Polonium** 210	85 At **Astatine** 210	86 Rn **Radon** 222
87 Fr **Francium** 223	88 Ra **Radium** 226.0	89 Ac **Actinium** 227	104 Rf **Rutherfordium** 257	105 Ha **Hahnium** 262													

58 Ce **Cerium** 140.1	59 Pr **Praseodymium** 140.9	60 Nd **Neodymium** 144.2	61 Pm **Promethium** 145	62 Sm **Samarium** 150.4	63 Eu **Europium** 152.0	64 Gd **Gadolinium** 157.2	65 Tb **Terbium** 158.9	66 Dy **Dysprosium** 162.5	67 Ho **Holmium** 164.9	68 Er **Erbium** 167.3	69 Tm **Thulium** 168.9	70 Yb **Ytterbium** 173.0	71 Lu **Lutetium** 175.0
90 Th **Thorium** 232.0	91 Pa **Protactinium** 231.0	92 U **Uranium** 238.0	93 Np **Neptunium** 237.0	94 Pu **Plutonium** 244	95 Am **Americium** 243	96 Cm **Curium** 247	97 Bk **Berkelium** 247	98 Cf **Californium** 251	99 Es **Einsteinium** 254	100 Fm **Fermium** 257	101 Md **Mendelevium** 258	102 No **Nobelium** 259	103 Lr **Lawrencium** 260

Newest Game Cartridges From Atari

Ace Of Aces, Desert Falcon, Mario Bros.

Reviewed by David Plotkin

ACE OF ACES

Ace of Aces is a rather complex game in which you need to be both the pilot and crew of a Mosquito fighter-bomber. You'll have your hands full, especially because of the incredibly frustrating control system.

You have the choice of either flying practice missions (dogfights, bomb the train, or bomb the submarine), or real missions which are far more challenging. During the practice mission you are simply placed on target and shoot at the enemy or drop your bombs.

In a real mission, you can choose to fly more than one mission before returning to base. If you can complete all four in one trip and come back alive, then you are the Ace of Aces.

You must equip your plane. If the mission is deep inside Europe, you'll need extra fuel tanks. Next, you decide how many rockets, how much cannon ammunition, and how many bombs to carry with you. The Mosquito has a limited lifting capacity, so you won't be able to take everything you'd like to.

You then begin the flight to your destination, using the map screen. It's best to stay away from weather systems and head straight to your destination.

There are five views you will need to switch between while engaged in a mission. First is the cockpit view, with all the necessary flight instruments—radar, altimeter, turn and bank indicator, compass, plus an instrument that tells the enemy's altitude.

The view out of the cockpit window is updated smoothly and the plane's control yoke moves at the bottom of the view in response to your joystick. The cockpit view also includes crosshairs for firing the cannons and rockets at enemy fighters and bombers.

In the heat of battle I found myself switching screens when I didn't want to.

Two other views include the left and right engines, where you can adjust the throttle, booster, trim and flaps, as well as control the landing gear. It is also here that you activate the fire extinguisher to put out an engine fire (which is visible out of the window).

The bomb bay view is where you can change weapons (cannon or rocket), switch fuel tanks, open the bomb bay doors and drop bombs. All views include an "intercom", which is a picture of the plane showing what parts are damaged. You can then switch to that view and attempt to correct the situation (e.g., putting out an engine fire).

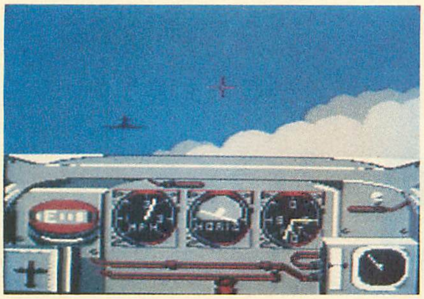
The graphics in Ace of Aces are good, but the system for switching screens is terrible. You can use the keyboard (keys 1 through 5), and these work fine. But the problem is that you can also double-press the fire button and move the joystick in certain directions to switch views.

In the heat of battle, I found myself switching screens when I didn't want to—usually resulting in bullet holes in the windscreen and my Mosquito crashing in flames. This happened over and over again. The result is even more noticeable if you have one of those rapid-fire attachments for your joystick!

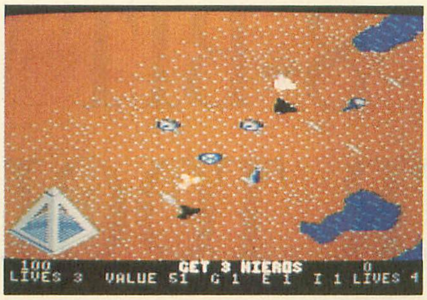
Because of this flaw in the control system, Ace of Aces is very frustrating. This is too bad, because as a battle simulator, it's very good and a lot fun to play.

DESERT FALCON

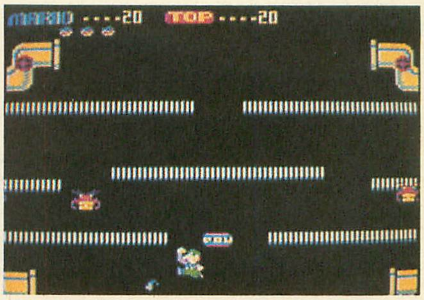
In **Desert Falcon**, your mission is to guide a giant mystical bird of prey



Ace of Aces



Desert Falcon



Mario Bros.

flying over a beautifully detailed scrolling desert.

Viewed in three-quarter perspective, the desert is lined with pyramids, sculptures and towers. For points, you can pick up treasures dropped by marauding grave-robbers. The falcon can land and hop around in the desert, although he is quite vulnerable when he does.

Also to be found in the desert are hieroglyphics. Picking up three of these useful items gives the falcon superpowers, including an "air bomb" which destroys all enemies, invincibility, and lots of points. Some of the so-called superpowers have some drawbacks. In particular, they can limit certain types of movement. Fortunately, the superpowers don't last very long.

The manual descibes a wide variety of enemies. Unfortunately, except for some flying triangles, they all looked pretty much alike and it was very hard to tell which enemy was which. However, it really doesn't matter, except for scoring.

Some enemies can only get you when you are on the ground, others are deadly in the air. Running into any enemy creature takes one of the falcon's five lives. Your falcon can also fire forward, destroying any enemy hit by its arrow missiles.

At the end of each section, there is a giant Sphinx. You have to blast it between the eyes while dodging the fireballs it is firing at you. If you manage to hit it the right place, you blast a satisfying hole in its head and proceed to the next stage.

The only difficult thing about Desert Falcon is the control scheme for flying the great bird, which takes some getting used to. But before long, you are moving the falcon around the screen smoothly, gathering prizes and blowing enemies to desert heaven. I like this game. It has excellent graphics and is very playable.

MARIO BROS

Mario Bros. takes you on the continuing adventures of Mario, the unfortunate plumber whose girlfriend was stolen by Donkey Kong. After recovering her from the amorous ape, he returns to his everyday work (with his brother Luigi in the two person version), only to find that their plumbing works are being overrun by all manner of strange creatures.

These creatures include the turtle-like shellcreepers, crab-like sidesteppers, hopping fighterflies, and so on. To eliminate them, Mario must get onto the level BELOW the creature, then jump up (press the joystick button), bumping the level above and flipping the creatures over. He must then jump up to the level the creature is on and kick it off the screen before it can right itself.

As the levels increase, everything gets more difficult. The sidesteppers must be bumped twice to get them to tip over, and they start to move faster after the first bump. The fighterflies hop around, and can only be bumped when they are touching the level.

There is a POW button which can be used three times to flip everything on the screen. There are also bonus rounds where gold coins can be collected for extra points. These coins occasionally show up during regular play as well.

The graphics and animation of Mario Bros. is excellently done. Mario even turns red and loses all his hair when he gets fried by a fireball! But make no mistake—this is a tough game. You won't get past the first few screens for quite awhile. ▲

$24.95 each, XL/XE with at least 64K memory. Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000.

8-BIT POWER TOOLS '89

Laserteller, Ultra Speed Plus, TurboWord 80.

Reviewed by Charles Cherry

LASERTELLER

Laserteller is a fancy-looking checkbook balancing program. Spectacular screen designs give the impression that you're working with some futuristic monster machine. The look makes Laserteller different and fun to use. If you have need for a simple checkbook balancer, Laserteller can do the job, and it will knock the eyes out of your friends with other computers.

Laserteller is not a true home accounting package. You can only review your last eight transactions and there is no record of to whom the payments were made, only the amount of the payment. But it's a quick and easy way to keep your balances up to date.

In practice, Laserteller supports only one checking account and one savings account. But since Laserteller is not copy protected, you could set up different disks for different accounts.

Laserteller also has a handy notepad, a small address book, and an ordering system. It can put these together and print an order for anything you like. I don't order much by mail, but this would be convenient for those who do.

The things I didn't like about Laserteller are minor. The screen designs make the menu selections a bit hard to read, but once you learn them, they're easy. It's nice to be able to print orders with Laserteller, but it's a little strange not to be able to print the checks. The Laserteller uses Automatic Teller vocabulary, i.e., an expenditure is called a withdrawal instead of a check.



Laserteller

$17.45, 48K disk. JVB Software, 6538 Hazeltine Ave., Van Nuys, Calif. 91401.

ULTRA SPEED PLUS

A couple of years ago I wrote a review for Ultra Speed, an alternative operating system by CSS for the XL/XE computers. I had used Ultra Speed for less than a month and I wrote a generally favorable review. However, not until Ultra Speed had been in my computer for a little longer did I begin to fully appreciate it. I couldn't live without it. I often regretted not having been more enthusiastic in my review.

Now **Ultra Speed Plus** has arrived from CSS and I can restate my approval more strongly. Quite simply, if you don't have Ultra Speed Plus, you're using a crippled Atari.

The name Ultra Speed comes from its support for US Doubler and Happy drives. When you're using Ultra Speed with these drives, all transfers take place in the high speed mode.

The "Plus" part of the name comes from some really incredible RAMdisk support. Ultra Speed Plus sets up a RAMdisk in extended memory and lets you renumber it any way you like, even as drive one. There's also a sector copier for quick copies to and from the RAMdisk. You can even boot the computer (instantly) from the RAMdisk.

Exact methods will vary with different DOSes and programs, but since Ultra Speed uses the normal SIO routines, your program should never know it's using a RAMdisk. For instance, I'm writing this review with PaperClip. I can save and load files instantly to the RAMdisk. Since the RAMdisk is drive one, I don't even have to fool with drive numbers in the filename.

When I'm through, I copy the RAMdisk to my US Doubler drive at ultraspeed. All with just a couple of keystrokes. It really brings PaperClip to life, especially when I'm editing together a document from multiple files.

There are other great features in Ultra Speed Plus which make it a necessity even if you don't have extended memory or fast drives. From the key-

board you can: toggle BASIC in or out, turn the screen off (increases computer speed 30%), lock the keyboard, use the arrow keys without [CONTROL], toggle the left margin to 0 or 2, toggle keyboard click and disk I/O sound, and display a higher contrast, easier to read, text screen. Ultra Speed Plus also speeds up the keyboard, my favorite feature.

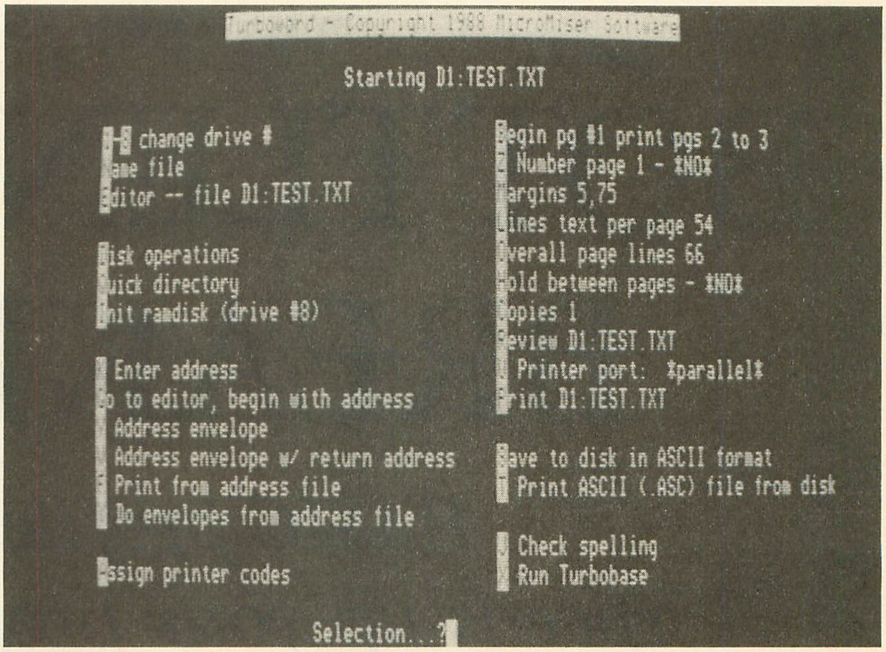
Although my review copy does not have it, the latest versions of Ultra Speed Plus include the Fast Chip floating point package. The arithmetic routines in the Atari are notoriously slow and inaccurate. The Fast Chip, which has been around for years, is an excellent replacement. It is a superb math package, both fast and accurate. It makes the Ultra Speed Plus truly complete. I can't think of anything else I would want in my Atari. But there is more. Ultra Speed Plus actually has three complete operating systems: Ultra Speed Plus, the normal XL/XE OS and a 400/800 OS. You flip between them with a three-position switch. Every program ever written for any Atari should run on one of these systems. Your compatibility problems are over forever.

Even more, Ultra Speed Plus also has a much improved self-test routine, one that really tells you something useful. Of course that leaves the self-test pin on the PIA free to bank-switch some more memory. So, as soon as RAM chip prices come down. . .

Installation is not too difficult if your OS chip is in a socket. There are just a couple of wires to solder and a hole to drill for the switch. If your OS chip is soldered in, I suggest that you get some knowledgable help. Of course, CSS can install everything for you.

I cannot imagine an Atari XL or XE owner who would not love having the Ultra Speed Plus in his or her computer.

$69.95, XL/XE, Computer Software Services (CSS), P. O. Box 17660, Rochester, NY 14617. (716) 467-9326.



TurboWord

TURBOWORD

At last! An 80-column word processor for the XEP 80-column adaptor. Ever since Atari announced the XEP80 adaptor, we've waited in vain for AtariWriter 80. Finally someone has moved to fill the gap. Micromiser Software, publisher of the superb TurboBase and TurboBase 80 database/business software, has added **TurboWord** to its line.

The workings of TurboWord will seem a little strange to people used to normal Atari word processors, but not to TurboBase users or those with experience in the MS-DOS world. To get the most out of your system, you need to spend a little time setting things up.

TurboWord is very modular and runs best with a RAMdisk. Like many top-of-the-line programs, it performs best with SpartaDOS (not included). ICD's SpartaDOS lets you use extra memory, directories, and even hard disks. With it you can build your own custom environment. TurboWord also runs under DOS XL and MYDOS, as well as DOS 2.5. I tested it with SuperDOS, but the XEP driver did not work (perhaps a memory conflict).

Of course TurboWord does all the normal word processing tasks (with the curious exception of search and replace). It also has macros, spell checking, and nice routines for letterheads and addressing envelopes. The program relies on your alertness; it's disconcertingly easy to overwrite a file on the disk. But, if you take the time to understand it, TurboWord is a powerful tool.

The XEP-80 puts out text which is readable on my color monitor, but you'll want a monochrome monitor to do any serious work. TurboWord makes the 8-bit Atari a serious choice for the professional writer.

Micromiser has a long history of excellent customer support and continuing improvements. They added a form feed command for laser printers when I requested it. If TurboWord does not fill your needs, they'll probably fix the software for you. I cannot recommend TurboWord for occasional users, but people willing to invest some effort in learning a high-powered word processor will find a great deal to like. ▲

$49.95, 48K disk. Micromiser Software, 1635-A Holden Ave, Orlando FL 32809. (407) 857-6014.

BY STAN LACKEY

BOTTLENECK BREAKER

BASIC profiler speeds up your programs.

Track down those bottlenecks in your BASIC programs with Bottleneck Breaker. By tracking the amount of processing time each program line requires, this BASIC profiler helps you pinpoint the routines that need the most streamlining. Bottleneck Breaker is a set of BASIC programs that work on all Atari 8-bit computers with at least 48K memory and a disk drive.

Programmers spend much time speeding up their programs. The most common streamlining methods include converting slow or heavily-used segments into machine language subroutines, using data tables in place of complicated functions, string equivalencing and a host of other techniques.

First, though, you have to find the bottlenecks—the slowest routines in your program. This can be difficult in a large program with many GOSUBs and GOTOs. Bottleneck Breaker finds these bottlenecks by identifying the program lines that use the most processing time. Such a "profiling" system lets you measure and record the performance of each section of your program.

Bottleneck Breaker consists of three programs that work together to analyze your BASIC program *as it is running.* Seconds after your program is done, the profiler's report is ready to be displayed or printed. With this report in hand, tracking down BASIC bottlenecks is as easy as reading a scorecard.

GETTING STARTED

Type in Listing 1, PROFILE1.BAS, check it with TYPO II and SAVE a copy to disk.

Next, type NEW then type in Listing 2, PROFILE2.LST, check it with TYPO II and LIST a copy to disk.

Now, type NEW, then type in Listing 3, PROFILE3.BAS, check it with TYPO II and SAVE a copy to disk.

Finally, type NEW, then type in Listing 4, PROFTEST.BAS, checking it with TYPO II, and SAVE a copy to disk. PROFTEST.BAS is a short BASIC program we'll use to test the profiler. It performs a variety of functions within a time-consuming loop, and is

a good program to start with.

Listing 5, PROFILE.M65, is the MAC/65 assembly language source code for the profiler. You do not need to type it in to use the programs.

Antic Disk owners will find all of these listings on the monthly disk.

YOUR FIRST TIME

Bottleneck Breaker is easy to use. Each program's final screen tells you what to type next. Before using the profiler on your own program, though, you should first try it on the short example program, PROFTEST.BAS. Put a disk containing your profiler programs into the drive and type:

RUN "D:PROFILE1.BAS"

This program loads the profiler's machine language routine and sets up the POKEY timer interrupt.

Next, LOAD the program to be profiled. For this test case, type:

LOAD "D:PROFTEST.BAS"

After making sure your program has no lines numbered 1-3 or 31000-31010, type:

ENTER "D:PROFILE2.LST"

This file adds the necessary commands to start and stop the profiler.

Finally, type RUN. It takes about a minute to clear the counters. Then, your BASIC program will begin.

As your BASIC program runs, the profiler monitors it and updates its counters, which are kept in a separate 8K block of protected memory.

When your program stops, you should see the message: DONE. . .

Next: RUN "D:PROFILE3.BAS

If you don't see this message, you *must* type GOTO 31000 at the READY prompt. Otherwise, the profiler will not stop profiling!

Now it is time for the profiler to fetch, analyze and display your results. If your printer is on, you'll automatically get a hard copy of your report.

Type: RUN "D:PROFILE3.BAS"

This can take some time to RUN, as the data sets can be large. As it runs it reports on its status. When done, it should print a report similar to the following:

TOTAL COUNTS = 3389

LINE	COUNTS	PERCENT	CUM PCT
120	2423	71.47	71.47
110	370	10.91	82.38
140	191	5.63	88.01
160	124	3.66	91.67

INTERPRETING THE REPORT

The report is sorted by execution speed, with the slowest program lines at the top.

The COUNTS column contains the raw data from the profiler's counters. The PERCENT column tells you what percentage of the processor's time was devoted to this line. The CUM PCT (Cumulative Percentage) column merely keeps a running total of the PERCENT column.

According to this report, line 120 has the biggest bottleneck. This line uses most of the computer's processing time—more than 71 percent of it! If you refer to PROFTEST.BAS, you'll see that line 120 contains a cosine function, which takes quite long time to execute.

Line 110 is the next largest bottleneck. This line contains a division operation, which also takes a long time, but only about one-seventh the time of the cosine function, according to the profile.

Checking the CUM PCT column, see that the four highest lines in the profile consume over 91% of the total processing time.

Note that the profiler uses a statistical method, and will probably never produce exactly the same results twice.

ABOUT PROFILING

A perfect profiling system would not take processing time away from your program, would not need any memory space, and would show how much time was spent executing each program line.

The ideal profiling system would also have a counter for each line in your BASIC program. These counters would keep a record of the number of times each line had been executed.

Finally, the profile would use all of this information to calculate an average of the actual time spent executing each statement.

While Bottleneck Breaker is not a perfect system, it is accurate and reliable enough to measure almost every type of BASIC program.

Since Bottleneck Breaker runs concurrently with the program being profiled, each must have its own share of processing time and RAM. Bottleneck Breaker needs about a 25 percent share of processing time. This means that your programs will RUN about 25 percent slower while they are being profiled.

The profiler also needs 8K of RAM for its counters. If you need to profile a large program that needs this 8K block of memory, you should break it into groups of stand-alone subroutines, LIST each group to disk, then individually profile each group.

Finally, Bottleneck Breaker does not have a counter for each line in your BASIC program. Instead, the profiler has one counter for each range of 10 line numbers. For example, any lines numbered 10-19 would all share counter #11, all lines within the range 20-29 would use #2, and so on.

If you number your program lines in tens (10, 20, 30. . .), as most BASIC programmers do, you'll have one counter for each line. If your program is not numbered in tens—and you

want to assign one counter per line—you must renumber your program. (NOTE: Some BASIC programs won't work if renumbered. Be sure to make a backup of your program *before* renumbering, just in case.)

HOW IT WORKS

Bottleneck Breaker is a collection of three BASIC programs that all work together. The first program, PROFILE1.BAS, POKEs the profiler's machine language (ML) counting and timing routine into memory, just above the counters.

The second program, PROFILE2.LST, is really just five lines of BASIC which are merged into the program to be profiled. These lines control the profiler's ML routine, clear the counters and set the timers.

The third program, PROFILE3.BAS, analyzes the 8K block of counters and displays the results of the profile.

The profiler stores its data in an 8K block of 16-bit counters. That's enough RAM for 4,096 counters. Since BASIC's maximum allowable line number is 32767 and up to ten lines may share a counter, we'll only need 3,276 counters, or a little more than 6K. The profiler's ML routine sits in the remaining 2K of this block.

THE SAMPLER

The brains of the system is the profiler's ML routine, called "SAMPLER." It is entered on the POKEY Timer One interrupt. SAMPLER is controlled through memory location 40704 ($9F00), which is used as a flag to start and stop profiling. SAMPLER checks this location whenever it receives the Timer One interrupt, and only proceeds if the value is not zero.

SAMPLER examines your BASIC program more than 250 times per second. During each pass it checks STMCUR (memory locations 138-139, $8A-$8B) to determine which line is being executed, then increments the appropriate counter.

After incrementing the counter, the routine checks for any overflows (the high bit will be a 1). When this happens, typically only after a very long run, SAMPLER is disabled. No further samples are taken, to avoid losing accuracy in the results.

CAUTIONS

Note that the SAMPLER routine uses memory locations 203-208 ($CB-$D0). If your program uses these locations, the profiler may produce wrong answers or crash.

You should also be sure that the program being profiled does not use lines 1-3 or 31000-31010. Otherwise, you won't be able to add the program lines which control the Profiler.

Finally, if the profiler tries to sample your program while the BASIC interpreter is moving from one line to the next, a garbage line number will appear in the final report. This happens rarely enough that it does not affect the results in any significant way.

130XE CHALLENGE

As written, Bottleneck Breaker requires 8K of RAM for its counters. **Antic** challenges you to relocate the profiler's counters to the 130XE's alternate memory bank, allowing the profiler to work with larger programs.

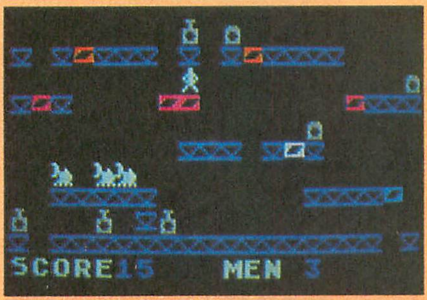
The best modification, in the opinion of the **Antic** staff, will receive the winner's choice of any single Antic Software product from the Arcade Catalog. Entries must be received before May 15, 1989. These become the property and will not be returned. Send your entries to: Bottleneck Contest, Antic Magazine, 544 Second Street, San Francisco, CA 94107.

Stan Lackey is a computer hardware engineer at BBN Advanced Computers Inc. in Cambridge, Mass. and a member of the Acton-Boxboro Atari Computer User Society (ABACUS.) This is his first appearance in **Antic**.

Listing on page 42

Shutdown

Escape those killer robots. **By Tony Barnes**



Shutdown is a challenging fast-action game where you dismantle the enemy power stations while evading the alien robots that have taken over. This BASIC program works on all 8-bit Atari computers with at least 48K, disk or cassette.

Trouble is brewing on Xena 5 with a capital "T". Mechanical aliens from an unknown planet have taken over all seven power stations on this world.

You are Jake Retron, an elite trooper in the Galactic Marine Corps and it is your duty to go into these seven stations and shut them down.

It won't be easy because the robots can detect all metals, so you can't bring in any weapons. Also, the only way to move up and down between platforms is to use the elevators scattered about. The only problem is that the aliens have reprogrammed them so you don't quite know where they'll take you.

GETTING STARTED

Type in Listing 1, SHUTDOWN.BAS, check it with TYPO II and be sure to SAVE a copy to before you RUN it. If you have any trouble typing in the special characters in lines 21010-21012, 23010-23012 and 30100-30140, don't type them in. Instead, type in Listing 2, check it with TYPO II and SAVE a copy. When you RUN Listing 2, it creates these hard-to-type lines and stores them in a file called LINES.LST.

To merge the two programs, LOAD "D:SHUTDOWN.BAS" and then ENTER "D:LINES.LST." Cassette users: CLOAD Listing 1, then insert the separate cassette used for Listing 2 and ENTER "C:". Remember to SAVE the completed program before you RUN it.

To shut down a station you must cut all the power going there. This is done by turning off the many generators scattered about, which you accomplish merely by touching them.

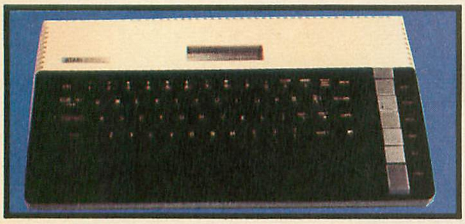
You move Jake by pressing the joystick left or right. Nothing happens when you press the joystick button or move the stick forward and back. To activate a lift all you must do is step onto it. If you get trapped you can restart that level by pressing the [START] key. This loses one of your lives, however. ▲

Tony Barnes was the author of Escape From Hell (June 1988).

Listing on page 43

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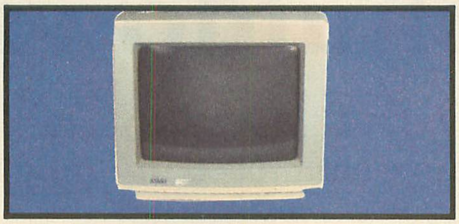
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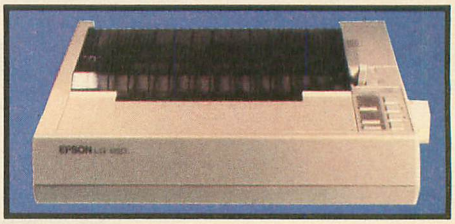
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B604

By Joe Kimbrough.

MiniMon

PEEK and POKE power from DOS.

With this machine language Mini-Monitor you gain the very useful capability of being able to POKE and PEEK from DOS! This BASIC program works on any 8-bit Atari with disk drive.

Seasoned BASIC programmers know how useful the POKE and PEEK commands are. However, when you leave BASIC, you're at the mercy of the DOS menu, restricted to the options it provides.

MiniMon is a machine language mini-monitor that gives you more control over your Atari when you're in DOS. MiniMon gives you emulated PEEK and POKE commands.

Suppose you're tired of your Atari's bland blue and white default colors. In BASIC it's easy enough to POKE different values into the color registers, but in DOS you're stuck with the default colors. MiniMon lets you change these colors from DOS, just as you would in BASIC.

Many XL/XE owners sooner or later find themselves trapped in DOS when BASIC has been disabled by either the [OPTION] key or a machine-language program. MiniMon lets you enable or disable BASIC at will *without rebooting*.

GETTING STARTED

Type in Listing 1, MINIMON.BAS, check it with TYPO II and SAVE a copy before you RUN it. When RUN, MINIMON.BAS creates a machine language file called MINIMON.EXE and writes it to your disk. *This* is the MiniMon program.

Listing 2, MINIMON.M65, is the MAC/65 assembly language source code for MiniMon. You do not need to type it in to use the program.

To start MiniMon, type DOS to get to a DOS 2.0 or 2.5 menu, then select menu choice L to load D:MINIMON.EXE. MiniMon will load and run automatically.

USING MINIMON

The menu offers three numbered choices—DOSPOKE, DOSPEEK and EXIT TO DOS.

If you select DOSPOKE, type the value to be POKEd into an address, press [RETURN] and then type the address and press [RETURN]. If you try to enter an illegal value (such as a negative number), MiniMon will ignore it and wait for a valid number. Press [ESC] to exit DOSPOKE and return to the MiniMon menu.

DOSPEEK works like DOSPOKE. Press [OPTION] to return to the MiniMon menu, press [START] to re-run DOSPEEK. The third menu choice simply returns you to DOS.

THINGS TO TRY

To change screen colors in DOS, run MiniMon and select DOSPOKE. Enter 200 at the first prompt and 710 at the second. Your screen will immediately turn green. This would be equivalent to typing SETCOLOR

2,12,8 from BASIC. If you enter 0 and 709, you'll get black text. This would be equivalent to typing SETCOLOR 1,0,0.

To disable BASIC in XL/XE models, put 255 into 54017. Putting 253 into 54017 will enable BASIC. However, a word of caution is in order here.

If BASIC has been disabled by holding down the [OPTION] key, then screen memory has been moved up 32 pages. Some machine language programs also move screen memory. If you put a 253 into location 54017 under such circumstances, you'll get a screen full of garbage.

To handle this situation, you must reposition the display list by following this procedure:

1. Use DOSPOKE to put 160 into location 106. This location, called RAMTOP, gives the total number of available pages of memory.

2. Exit to DOS with MiniMon selection 3.

3. Choose DOS option M, type 2075 and press [RETURN]. This reprints the DOS menu, but it has the same effect as a BASIC GRAPHICS 0 command—it moves the display list and data below the new RAMTOP.

4. Re-run MINIMON.EXE and use DOSPOKE to put 253 into location 54017.

5. Exit to DOS with MiniMon option 3 and use DOS option B to go to BASIC.

HOW IT WORKS

MiniMon bypasses CIO and directly accesses the operating system's "put character" and "Keyboard GETBYTE" routines for getting and printing characters.

Unfortunately, the 800's OS and the XL or XE's OS place these routines in different locations. So MiniMon must begin by determining what type of computer it's running on and modify itself accordingly.

MiniMon determines what type of computer it's running on by inspecting memory location 64728 ($FCD8). If this location contains a 162, MiniMon is running on an 800 and must modify itself before continuing. A 76 here denotes an XL/XE, so MiniMon will not modify itself.

*(**Antic** prefers to avoid such potentially dangerous programming practices whenever possible. We discourage readers from writing self-modifying programs or making illegal system calls to the OS, if it can possibly be avoided.*—ANTIC ED)

All of the really hard work in MiniMon is done by the floating point routines in the operating system. When you type in a value, say 234, what actually goes into the computer is 50,51,52—the ASCII values for 2, 3 and 4. These three bytes must be converted into one byte containing the integer 234.

First, your Atari converts the ASCII values into floating point form, then converts the floating point number into an integer.

DOSPEEK works the opposite way. The value contained in an address is an integer which must be converted into ASCII for you to read it. Again, it's a two-step process—converting an integer to a floating point value, then changing the floating point value to ASCII.

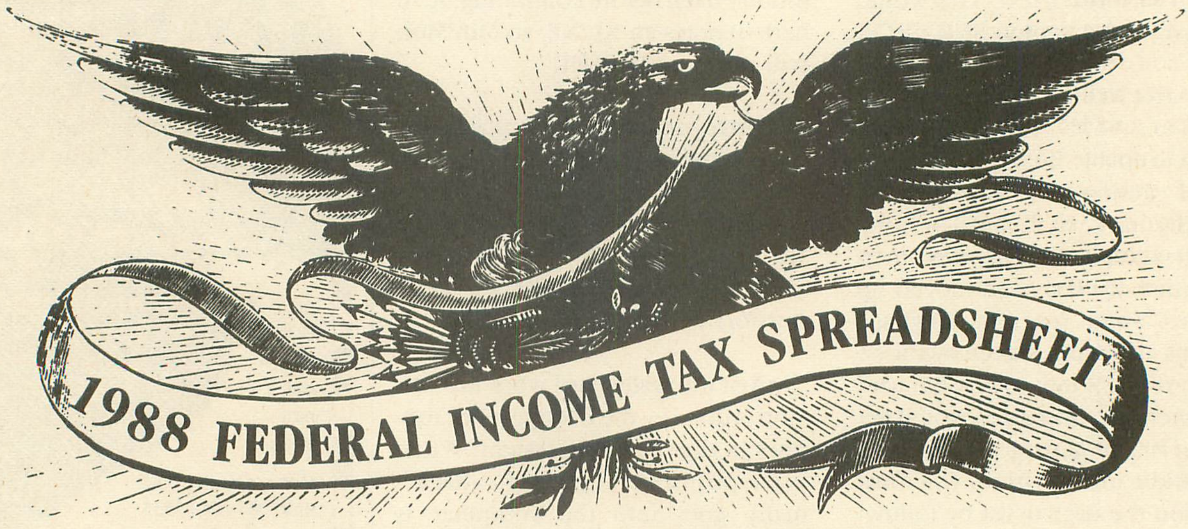
MiniMon uses all four of these conversion routines—ASCII to Floating Point (beginning at address 55296, $D800), Floating Point to ASCII (55526, $D8E6), Integer to Floating Point (55722, $D9AA), and Floating Point to Integer (55762, $D9D2).

MiniMon requires only 667 bytes and resides in memory at 13312 ($3400). It takes up only six disk sectors, and can give you much welcome additional flexibility when using DOS.

Joe Kimbrough is a professor of English from Houston, Texas. He uses his Atari for many tasks, but it does yeoman service as a word processor. This is his first appearance in **Antic**.

Listing on page 35

BY TOM CHANDLER



ANTIC'S ANNUAL 1040 SYNCALC TEMPLATE

•

***Antic's* Annual Federal Income Tax Spreadsheet Templates have been among our most popular features. Now you can calculate your 1988 federal income taxes on your 8-bit Atari. Requirements for running the 8-bit Atari template are minimum 48K memory and a disk drive, plus SynCalc spreadsheet software (which unfortunately is no longer being sold by Broderbund). A printer is optional, but you'll need your official Internal Revenue Service 1988 tax instructions and forms.**

•

If April 15 is approaching, it's time to calculate your Federal Income Tax again. But at least you can count on much less hassle when you do the number crunching with your 8-bit Atari, **Antic's** Annual Income Tax Template, and SynCalc spreadsheet (no longer sold by Broderbund, but perhaps back copies are still available). This IRS tax template will make it simple for you to experiment with various alternative "what if" strategies for minimizing the taxes you owe.

The Annual **Antic** Federal Income Tax Spreadsheet Template includes fewer forms than in previous years, because of the "simplified" tax law. (For example, there's no more Income Averaging deduction.) So for 1988 you'll get:

- IRS 1040 Long Form
- Schedule A (Itemized Expenses)
- Schedule B (Interest and Dividends)
- 2106 Form (Employee Business Expenses)

We use SynCalc software for the **Antic** tax templates because SynCalc is still the most widely used 8-bit Atari spreadsheet that will perform income tax calculations. If you don't have a printer, you can just hand-copy the

figures from the screen to your printed IRS forms.

Even if you've never used SynCalc before, you should be able to work through the well-written manual in a few hours and learn enough to use this tax template. But you're leaving yourself open for unnecessary aggravation if you try to start working on the tax template without taking enough time to become adequately familiar with SynCalc.

Please, if you need help with SynCalc, try Broderbund Technical Support at (800) 527-6263—don't phone **Antic**! However, if any last-minute fixes are needed in the template itself, the information will be on CompuServe's ANTIC ONLINE. (Type GO ANTIC when you log onto CompuServe and you'll see any necessary bulletins.)

Please be careful and use common sense in figuring out your tax return. If you doubt the accuracy of the template findings, check with a registered tax preparer. User and programmer errors are always a possibility. **Antic** can't take responsibility for any mistakes made in your tax return as a result of using this template.

TAX SPREADSHEETS

Spreadsheet programs are an ideal tool for preparing tax returns. You type in personal data such as income and deduction amounts, and customized formulas tell the spreadsheet how to compute the tax obligation from your data. Each data element or formula is entered in a "cell" with an address—similar to the lines and columns on the tax form. As your data changes (if you find another receipt, for example), just go to the proper cell, type in that number and press [START]. Your entire tax return will begin to recalculate.

Important: please remember that SynCalc calculates by rows or columns—so this template must be calculated at least *five times*. Press [START] five times after changing any figure.

You'll need the official 1988 Internal Revenue Service tax instructions and forms nearby. There isn't enough Atari memory to duplicate the forms exactly, so abbreviations are used wherever possible. But the template follows IRS line numbers, so you won't get lost.

After you enter the information into the spreadsheet, it calculates every line except the actual tax you owe. Putting all the tax tables into the template would chew up memory and typing time. So when you determine your Net Taxable Income on the template, look up the matching tax obligation in the Tax Table or Tax Schedule in your IRS instruction booklet.

Spreadsheet programs are an ideal tax tool.

The spreadsheet template can be reused for many different 1988 tax returns if you retain a blank version on disk. Entering a taxpayer's personal data should take about an hour. Save each completed tax template under a different filename.

This long, narrow template consists of 205 rows (out of a possible 255 maximum) by four columns. You *don't* need to type in any schedules or forms that you won't use—the 1040 form will work without them. If you type in template sections that you later decide not to use, just leave those cells blank and they won't become part of the overall calculations for the return.

TEMPLATE TYPE-IN

Antic Disk owners will find this template on the monthly disk under the filename TAX1040.SC. You'll need to boot SynCalc before loading TAX1040.SC.

For the purposes of this article, I must assume that you're familiar with SynCalc. For instance, you should know that pressing [OPTION] starts a command sequence, how to move around within the spreadsheet, etc. Keep your SynCalc manual handy, if you have any doubts.

Format a blank disk for data. Before typing anything in, set the column widths as follows: column A, 4; column B, 35; columns C and D, 9 each.

Set GLOBAL FORMAT to PRECISION 0 (to round off cents to the nearest dollar) and COMMA (to insert commas in numbers like 1,000). To speed up data entry, issue the command GLOBAL RECALCULATE MANUAL. Also, set calculation to ROWS.

In this year's template, the IRS form line numbers are in 4-width column A and the text descriptions are in 36-width column B. The actual figures and formulas are in 9-width columns C and D. While entering titles in column B, set FORMAT JUSTIFY LEFT. When entering the numbers and formulas in columns C and D, set FORMAT JUSTIFY RIGHT, and also right-justify column A.

The template is divided into separate sections, one for each tax form or schedule. Each section has two parts. Part A is the format set-up: titles, labels, etc.—with zeros (0) temporarily standing in for your actual number and formula locations. Part B contains the formulas. I'd suggest starting at cell A1 and working down column A using SynCalc's automatic cursor movement. Then go to column B and enter the titles.

You might consider typing in and testing each section before proceeding to next one. Part A of each section starts with the SynCalc row number. *Don't* type in these row numbers. The tax form line numbers are under the dashes for column A.

Here's a data compression tip: SynCalc uses 16 bytes to store every number. Text entries take only four bytes, plus one byte per character. Unless

you use a number in a calculation, enter it as text. In fact, all form line numbers such as the ones in column A *must* be text. Start each text entry with quotation marks (") or you'll run out of memory.

The last step in Part A is to enter all the zeros. The zeros "hold open" the cells for formulas and values to come later. Most zeros are in columns C and D. As you enter them, use this undocumented tip: the /K command toggles automatic cursor movement on and off. Also, you can move the cursor arrows in a menu without holding down [CONTROL].

Now that the template format is typed in, use Part B of each section for cell formulas. The listing shows each cell address, followed by the entry. *Don't* type the cell addresses (such as C133) shown in the first three or four spaces at the left. Instead, *go to* that cell and type in the formula, typing over the space-holding zeros entered earlier. A formula element like D122 is not text—type it as +D122 so that SynCalc will know it's a numeric entry. As you enter each formula, protect it with a /FO (FORMULA PROTECT ENTRY) so you won't accidentally write over it.

TIPS & TRICKS

Because this template pushes SynCalc to its limits, you'll need to use some advanced spreadsheet operation techniques in order to get everything working properly. Since SynCalc occasionally wastes a few cells, if you get the famous ERROR 100 NOT ENOUGH MEMORY message, save the file immediately. Now erase the file in memory with the /E# command and then reload the file from disk. This save/erase/load process deletes unnecessary entries.

To squeeze in long cell formulas, don't type spaces between words. Even more importantly, when you first type in the formulas, leave out words like THEN, ELSE or LOOKUP. Then press [RETURN]. You'll get a SYNTAX ERROR message because of the missing words, but go back and enter those words with the [CONTROL] [INSERT] keys. This lets you put an "illegal" amount of characters into a cell. The final characters will be pushed off the screen, but they're still in memory. (There are limits, of course—don't insert more characters than you need to.)

After you correctly type in the complete spreadsheet template, remember to save a blank copy under a name like BLNK1040 before entering any taxpayer data. Loading that blank file lets you do returns for many different taxpayers—just save each return with a different filename. ▲

Tom Chandler has a degree in finance and is an accountant.

Listing on page 46

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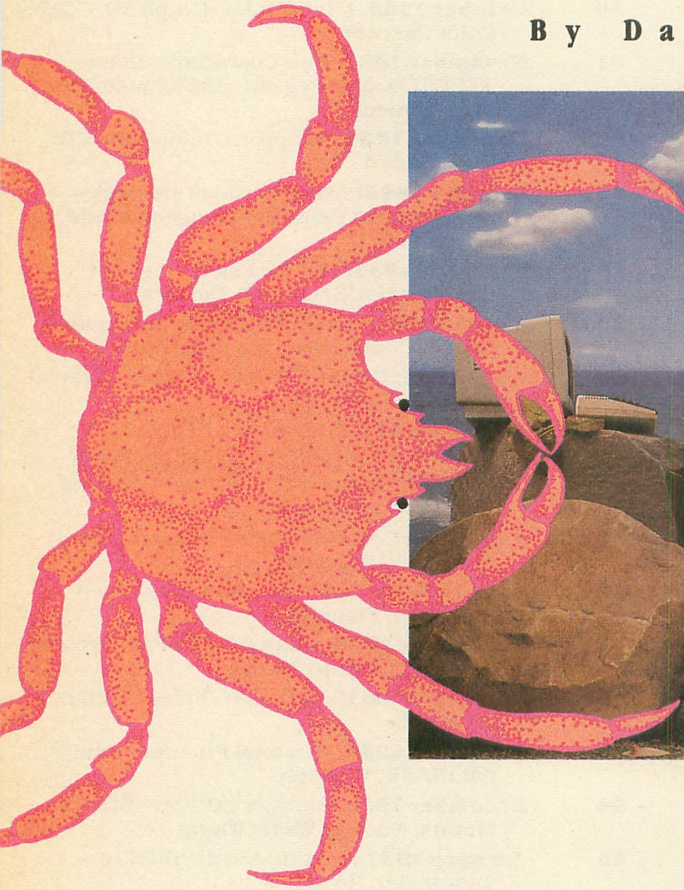
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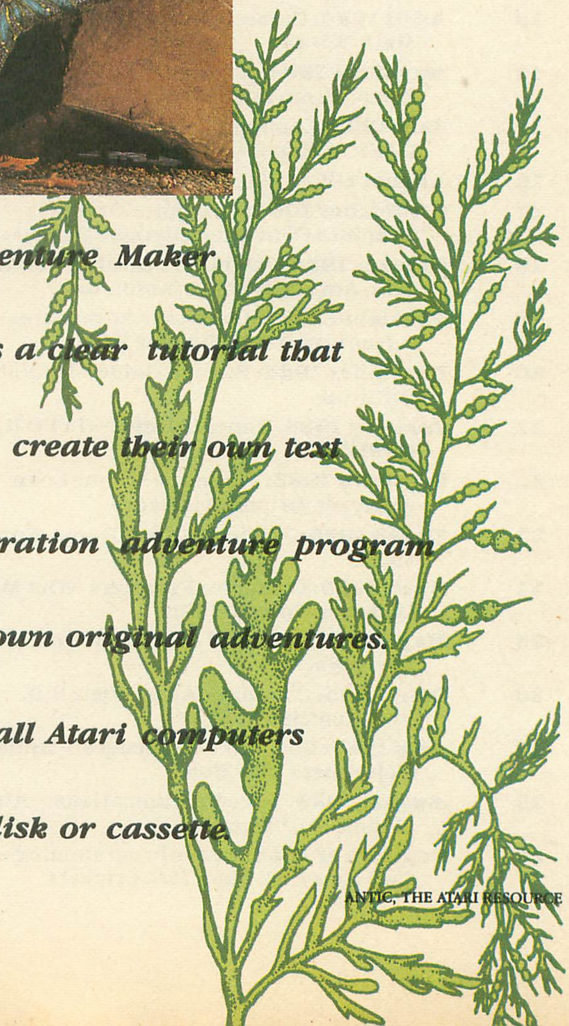
Adventure Works

EASY WAY TO PROGRAM TEXT ADVENTURES.

By David Woolley







Adventure Maker is a clear tutorial that shows new programmers how to create their own text adventures. It includes a short demonstration adventure program which can be easily adapted to your own original adventures.

This BASIC program works on all Atari computers with at least 32K memory, disk or cassette.

Type-In Software

For a novice programmer, getting adventures from your Atari can be difficult. But with a short overview of the necessary elements, text adventure games can really be written with ease.

This article includes Escape From Barnaby's Isle, a simple demonstration adventure designed to illustrate how the pieces of the puzzle fit together—and to provide programming routines and structures that you can adapt for your own adventure creations.

GETTING STARTED

Type in Listing 1, BARNABY.BAS, check it with TYPO II and remember to SAVE a copy before you RUN it.

Programming a text adventure is straightforward. The program must READ information from a list of DATA, display that information, INPUT the player's action, then perform that action and display the results. To get an idea of how it all comes together, I suggest you first play Escape From Barnaby's Isle.

The object of this game is to escape from the island. The list of commands you can use is very short—GO, GET, EXAMINE, INFO, and USE. You should be able to solve the game easily.

After you complete the game, LIST it on screen and look at it again. The most frequently used variables, strings, and arrays are N$(nouns), V$(verbs), O$(objects), O(objects carried), F(flags), D$(descriptions), C$, X and Y.

WRITE AN ADVENTURE

Writing your own text adventure program will require a lot of thought. First think of a setting and a final objective. The setting might be a haunted house, the English countryside or an alien planet.

The objective is something that the player must do to win the game (just "adventuring" or exploring can get pretty boring). The setting for Escape From Barnaby's Isle is a deserted island, and the objective is to leave the island.

Next, imagine items and locations that fit in with the setting. If the setting is a forest, you might find an axe in a grove of oak trees, or mushrooms by a dead tree stump.

After you create some interesting designs for your game, draw a map of the area in which the game takes place. Familiarize yourself with the world you just created, and then draw what I call a "plot" map.

A plot map is drawn on a graph so that each location can be described by ordered pairs. For instance, in Barnaby's Isle, the North Beach location is at (3,5).

The plot map has two axes, based on compass points. North and south are on the X-axis. East and west are on the Y-axis. When the program goes through the DATA lines in the routine at lines 15-35, it finds the ordered pairs.

At the start, the player begins at location (3,1), or X=3 and Y=1 (see line 10). If the player goes north, the program adds one to the Y variable, making it 2. The program then finds the data on location (3,2), the Crossroads.

If the player goes west, the value of X increases—eastward, X decreases. These calculations occur in lines 115-140.

Now you must draw three lists, one for verbs, one for nouns and one for flags. These lists may vary in length, depending on the size of your game.

Having a variety of verbs in your program adds interest and challenge. USE is too general, but I put it in *Barnaby's Isle* just to demonstrate how the subroutine to manipulate objects works. Try being more specific—instead of USE SPADE, you might try DIG HOLE.

INFO is a one-word command. Normally, a one-word command will cause an error in this program, unless you insert a line telling the program to go elsewhere. This is done at line 111.

Your noun list will probably be much longer. Nouns used in Barnaby's Isle are RAT, BOOK, CUTLASS, APPLE, TALISMAN, CHEST, BOAT, TROLL, TREE and SHACK. Some objects can be picked up, some can be used and all can be examined.

Whenever a player GETs an object, a corresponding variable in the O( ) array is set to 1. You can see how this works in line 170, part of the GET routine:

```
170 IF N$="RAT" AND X=5 AND Y=2 AND O(1)=0 THEN O(1)=1: GOTO 200
```

Now the program can easily determine if the player is carrying the rat by checking the value of O(1). If he has the rat, O(1)=1. Otherwise, O(1)=0.

The Flags List, contained in the F( ) array, shows the condition of the flags that might change during the game. These include whether or not a door has been closed or a magic rune has been read. Such things are vitally important to keep track of.

Barnaby's Isle has eight flags. Each may be switched on by placing a '1' into the corresponding slot of the F( ) array. For instance, when you EXAMINE CHEST, flag 6 is switched on (LET F(6)=1) then the program prints the appropriate response.

Now, whenever you type INFO, the

The game needs an objective—just exploring can get pretty boring.

program will check to see if flag 6 is on. If so, the program will display what was inscribed inside the chest.

PROGRAM TAKE-APART

Lines 5-7 contain the title page and determine whether or not to disable the [BREAK] key. Text adventures normally require a lot of typing, so it's always a good idea to disable the [BREAK] key to keep the user from stopping the program with an accidental keypress.

If you *want* to use the [BREAK] key, on the other hand, just hold down the [SELECT] key when you type RUN and [BREAK] will be enabled.

Line 8 sets the graphics mode and changes the background colour to black. Lines 10-12 DIMension the strings and arrays to be used.

Lines 15-35. This routine takes the player's current X and Y coordinates and searches through the DATA statements to find the rest of the information for that location. Then it reads the description (D$), object (O$), and directions in which the player can travel (N$).

The DATA lines (10000-10014) are important, so I will show you how they work using the South Beach location as an example. This information for this location is in line 10000:

10000 DATA 3,1,SOUTH BEACH.A BEATEN TRACK LEADS NORTH. TALL CLIFFS LOOM UP ON EITHER SIDE., ♥ ,NOOO

Here, 3 and 1 are the respective X and Y coordinates of South Beach. The description follows. Here, the description is: SOUTH BEACH. A BEATEN TRACK LEADS NORTH. TALL CLIFFS LOOM UP ON EITHER SIDE.

Next, there is a list of objects found there. If there are no objects, just use a single "heart" character (a [CONTROL][,]).

The object's name and the noun don't have to match exactly. Here, the object's name can simply be the phrase used to describe the object. The noun is the word as found in N$, which is the form the player must use. As an example, the object in location (2,3) is described as a MAGIC TALISMAN. To pick it up or use it you must use the specific noun, as in GET TALISMAN.

Finally comes the direction code. This is a short string which shows the directions in which the player can travel. Directions are entered in the order north, south, east, west (NSEW). If the player is not permitted to go in a certain direction, that direction is represented by an O. In the above example, the string NOOO means the player may only travel north. In the string NOEO, however, the player can travel only north and east.

Your games can be as simple or as complex as you're willing to make them.

Lines 40-54 display all data about your location. Line 42 jumps to a subroutine at 425 which checks the O() array to see if there is an object at the player's current location, and whether or not the player has that object. If O$ is one character long, the subroutine renames O$ to NOTHING. The exception is the apple. There will always be fruit on the apple tree.

Lines 51-54 print all the directions in which the player can travel.

Line 55 prompts the player for the next command, then places that command into A$. Line 60 jumps to a subroutine at 95 which will break A$ into two parts—the verb (V$) and the noun (N$). Line 111 checks to see if V$ is INFO, a one-word command. If A$ contains only one word, the routine RETURNs to avoid an error. Otherwise, it extracts the noun, N$, to complete the command.

Lines 65-90 direct the program to the correct subroutine indicated by the verb.

Lines 112-130, the GO routine, calculate the player's new position, and then return to 15 to READ new data.

Lines 170-200 contain the GET routine. A player may pick up an object only if *all* of the following criteria are met:

—The object exists and can be picked-up.

—The player is in the same place as the object (their X and Y coordinates match).

—The player has not yet picked it up. (If O(x)=0)

Once picked up, the object's corresponding flag in O() is set to 1.

Some objects that cannot be picked up have specific responses here, too. If the noun is unknown or incorrect, the location is wrong, or the object is already being carried, the bell sounds and an error message is displayed.

Lines 205-207 contain the USE routine, which checks the objects you can USE to make sure they are being carried or are at the current location.

Then, depending on the object in question, a flag might be switched on (as is the case with RAT, BOOK and TALISMAN), or a part of O() is switched off, as in the case of the APPLE. Once the APPLE is USEd (eaten) you no longer have it.

The results are then printed, and the program returns to line 55.

Starting at Line 235, EXAMINE is the biggest subroutine, yet it is one of the simplest. It uses all the nouns (some of them more than once) and

is mainly there to give players extra information.

Each object you can pick up is checked twice, once to see if it is being carried, and then to see if the player is in the correct location. Objects that cannot be picked up are checked only once. (The exception is TREE, which must be checked three times to determine which of the three trees is being examined.) The results are then displayed, flags set in some cases, and then the program goes to the prompt WHAT NOW? at 55.

The INFO routine is next, in lines 235-317. It displays a list of all the useful verbs, then a list of all objects held. Finally, it prints a list of clues found by the player, and returns to line 55.

The final part is at 475-520, the old CONGRATULATIONS! or YOU'VE WON! routine, often accompanied by a system of scoring. In Escape From Barnaby's Isle the player gains two points for every flag switched on, and four points for every object.

ADVENTURE CONTEST

Now that you have some idea of how text adventure games work and have seen how the elements are coordinated, you can start writing your own using this as a guideline. Your games can be as simple or as complex as you're willing to make them. Remember, adventure games are not limited so much by your computer's memory, but by your own imagination.

Antic will publish as disk bonuses the best short adventures created with this program structure. Adventures must be written in standard Atari BASIC and must be able to RUN on a 48K computer.

David Woolley is a student from New Zealand. This is his first appearance in **Antic**.

Listing on page 34

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TYPING SPECIAL ATARI CHARACTERS

The Atari Special Characters and the keys you must type in order to get them are shown below:

For [CONTROL] key combination, *hold down* [CONTROL] while pressing the next key. For inverse [CONTROL] [A] through [CONTROL] [Z], press the [◪] key—or [⅄] on the 400/800—then *release* it before pressing the next key. (Press [◪] or [⅄] again to turn off inverse.) For [ESC] key combinations, press [ESC] and then *release* it before pressing the next key.

Carefully study the chart above and pay close attention to differences between lookalike characters such as the slash key's [/] and the [CONTROL] [F] symbol [◪].

NORMAL VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	CTRL ,		CTRL S
	CTRL A		CTRL T
	CTRL B		CTRL U
	CTRL C		CTRL V
	CTRL D		CTRL W
	CTRL E		CTRL X
	CTRL F		CTRL Y
	CTRL G		CTRL Z
	CTRL H		ESC ESC
	CTRL I		ESC CTRL –
	CTRL J		ESC CTRL =
	CTRL K		ESC CTRL +
	CTRL L		ESC CTRL *
	CTRL M		CTRL .
	CTRL N		CTRL ;
	CTRL O		SHIFT =
	CTRL P		ESC SHIFT CLEAR
	CTRL Q		ESC DELETE
	CTRL R		ESC TAB

INVERSE VIDEO

FOR THIS	TYPE THIS
	ESC SHIFT DELETE
	ESC SHIFT INSERT
	ESC CTRL TAB
	ESC SHIFT TAB
	⅄ CTRL .
	⅄ CTRL ;
	⅄ SHIFT =
	ESC CTRL 2
	ESC CTRL DELETE
	ESC CTRL INSERT

TYPO II AUTOMATIC PROOFREADER

TYPO II automatically proofreads **Antic**'s type-in BASIC listings. Type in the listing below and SAVE a copy to disk or cassette. Now type GOTO 32000. At the prompt, type in a single program line **without the two-letter TYPO II code at the beginning**. Then press [RETURN].

Your line will reappear at the bottom of the screen. If the TYPO II code does not match the code in the magazine, then you've mistyped your line.

To call back a previously typed line, type [*], then the line number, then [RETURN]. When the completed line appears, press [RETURN] again. This is how TYPO II proofreads itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000. To remove TYPO II from your program, type LIST "D:FILENAME",0,31999, then [RETURN], then NEW, then ENTER "D:FILENAME", then [RETURN]. Now you can SAVE or LIST your program to disk or cassette.

Don't type the TYPO II Codes!

```
WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINE$(120):CLOSE #2:CLO
   SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "↖":POSITION 11,1:? "TYPO II"

EM 32050 TRAP 32040:POSITION 2,3:? "Type
   in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2;LINE
   $:IF LINE$="" THEN POSITION 2,4:LIST B
   :GOTO 32060
XH 32070 IF LINE$(1,1)="*" THEN B=VAL(LIN
   E$(2,LEN(LINE$))):POSITION 2,4:LIST B:
   GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$):POSITION 1,3:? " ";
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
ET 32120 ? "↖":POSITION 11,1:? " TYPO II 
   ":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3;LINE$:IF
   LINE$="" THEN ? "LINE ";B;" DELETED":G
   OTO 32050
VV 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
   ANS+(C*ASC(LINE$(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$
   (LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
   t match press  RETURN  and edit line a
   bove.":GOTO 32050
```

ADVENTURE WORKS

Article on page 28

LISTING 1

Don't type the TYPO II Codes!

```
VP 1 REM ESCAPE FROM BARNABY'S ISLE
QT 2 REM BY DAVID WOOLLEY
OP 3 REM (c)1988, ANTIC PUBLISHING INC.
PM 4 REM (DO NOT RENUMBER THIS PROGRAM!)
RO 5 POKE 1791,PEEK(53279):GRAPHICS 18:?
   #6:? #6:? #6;"      ESCAPE FROM"
FP 6 ? #6:? #6;"     barnabys isle"
FE 7 FOR QQ=1 TO 4000:NEXT QQ
QX 8 GRAPHICS 0:CLR :POKE 710,0:BRK=PEEK(
   1791)<>5:GOSUB 600
PG 10 DIM A$(100),B$(101),D$(100),O$(50),
   C$(4),V$(50),N$(50),O(5),F(8):X=3:Y=1
UN 12 FOR QQ=1 TO 5:O(QQ)=0:NEXT QQ:FOR Q
   Q=1 TO 8:F(QQ)=0:NEXT QQ
XD 15 FOR QQ=10000 TO 10014
NQ 20 RESTORE QQ
ON 25 READ XX,YY,D$,O$,C$
UI 30 IF XX=X AND YY=Y THEN 37
QZ 35 NEXT QQ
JT 37 IF X=3 AND Y=5 THEN 415
LY 40 ? "}":? :? D$
SS 42 GOSUB 425
SP 45 IF LEN(O$)=1 THEN O$="NOTHING"
AC 50 ? :? "YOU CAN SEE:";O$;".":? :? "VI
   SIBLE EXITS:";
ZS 51 IF C$(1,1)="N" THEN ? "NORTH ";
MG 52 IF C$(2,2)="S" THEN ? "SOUTH ";
MB 53 IF C$(3,3)="E" THEN ? "EAST ";
VB 54 IF C$(4,4)="W" THEN ? "WEST ";
CO 55 ? :? "WHAT NOW";:INPUT A$
XJ 60 GOSUB 95
CM 65 IF V$="GO" THEN 115
JK 70 IF V$="GET" THEN 170
NZ 75 IF V$="USE" THEN 205
XI 80 IF V$="EXAMIN" THEN 235
QX 85 IF V$="INFO" THEN 320
TO 90 ? "YOU CAN'T DO THAT!":GOTO 55
VH 95 FOR QQ=1 TO LEN(A$)
TK 97 TRAP 90
DK 100 IF A$(QQ,QQ)=" " THEN 110
RP 105 NEXT QQ
BI 110 V$=A$(1,QQ-1)
OS 111 IF V$="INFO" THEN RETURN
RQ 112 N$=A$(QQ+1,LEN(A$)):RETURN
MN 115 IF N$="NORTH" AND C$(1,1)="N" THEN
    Y=Y+1:GOTO 15
BM 120 IF N$="SOUTH" AND C$(2,2)="S" THEN
    Y=Y-1:GOTO 15
ZF 125 IF N$="EAST" AND C$(3,3)="E" THEN
    X=X+1:GOTO 15
JS 130 IF N$="WEST" AND C$(4,4)="W" THEN
    X=X-1:GOTO 15
FK 140 ? "YOU CAN'T GO THAT WAY!":GOTO 5
   5
HO 170 IF N$="RAT" AND X=5 AND Y=2 AND O(
   1)=0 THEN O(1)=1:GOTO 200
DM 175 IF N$="BOOK" AND X=3 AND Y=3 AND O
   (2)=0 THEN O(2)=1:GOTO 200
YK 180 IF N$="CUTLASS" AND X=4 AND Y=4 AN
   D O(3)=0 THEN O(3)=1:GOTO 200
EL 185 IF N$="APPLE" AND X=2 AND Y=2 AND
   O(4)=0 THEN O(4)=1:GOTO 200
YO 190 IF N$="TALISMAN" AND X=2 AND Y=3 A
   ND O(5)=0 THEN O(5)=1:GOTO 200
PW 191 IF N$="CHEST" AND X=4 AND Y=4 THEN
    ? "IT'S FAR TOO HEAVY.":GOTO 55
VQ 192 IF N$="BOAT" AND X=3 AND Y=5 THEN
   ? "IT'S FAR TOO HEAVY.":GOTO 55
HU 193 IF N$="TROLL" AND X=3 AND Y=4 THEN
    ? "HE WON'T COOPERATE.":GOTO 55
KD 194 IF N$="TREE" AND (X=4 AND Y=1) OR
   (X=2 AND Y=2) OR (X=2 AND Y=3) THEN ?
   "IT'S FAR TOO BIG.":GOTO 55
XW 195 ? "I DON'T KNOW THAT OBJECT!":GOT
   O 55
VJ 200 ? "YOU HAVE NOW GOT THE ";N$;".":G
   OTO 55
IC 205 IF N$="RAT" AND O(1)=1 AND F(1)=1
   AND X=3 AND Y=4 THEN ? "THE TROLL RUNS
    OFF, SCREAMING.":F(2)=1:GOTO 55
JX 210 IF N$="BOOK" AND O(2)=1 THEN RESTO
   RE 1000:READ B$:? B$:F(1)=1:GOTO 55
NV 215 IF N$="CUTLASS" AND O(3)=1 AND X=3
    AND Y=4 THEN ? "IT HAS NO EFFECT!":GO
   TO 55
VX 220 IF N$="APPLE" AND O(4)=1 THEN ? "I
   T TASTES QUITE NICE.":O(4)=0:GOTO 55
WN 225 IF N$="TALISMAN" AND O(5)=1 THEN ?
    "A STRANGE VOICE SAYS:'ROLLIN THE MAG
   ICIAN WAS RIGHT!'":GOTO 472
EI 227 IF N$="BOAT" AND X=3 AND Y=5 THEN
   475
NJ 230 ? "YOU CAN'T DO THAT!":GOTO 55
KX 235 IF N$="BOAT" AND X=3 AND Y=5 THEN
   ? "IT LOOKS STURDY ENOUGH TO RETURN YO
   U HOME.":GOTO 55
HF 237 IF N$="AREA" OR N$="LOCATION" THEN
    40
PL 240 IF N$="TROLL" AND X=3 AND Y=4 THEN
    ? "HE LOOKS REAL MEAN AND UGLY.":GOTO
    55
OL 245 IF N$="SHACK" AND X=3 AND Y=3 THEN
    ? "IT HAS 4 EXITS, AND LOOKS PRETTY R
   UN DOWN.":GOTO 55
LB 250 IF N$="TREE" AND X=2 AND Y=3 THEN
   ? "THE OAK TREE LOOKS VERY OLD.CARVED
   INTO IT IS:'U-T-R'.":GOTO 450
MI 255 IF N$="TREE" AND X=2 AND Y=2 THEN
   ? "THE APPLE TREE LOOKS VERY YOUNG.CAR
   VED INTO IT IS:'S-H-A'.":GOTO 455
ZG 260 IF N$="TREE" AND X=4 AND Y=1 THEN
   ? "THE PALM TREE LOOKS VERY STRANGE.CA
   RVED INTO IT IS:'E-E-T'.":GOTO 460
QD 265 IF N$="RAT" AND O(1)=1 THEN ? "IT
   LOOKS QUITE DEAD.":GOTO 55
FC 270 IF N$="RAT" AND X=5 AND Y=2 THEN ?
    "IT LOOKS QUITE DEAD.":GOTO 55
UT 275 IF N$="BOOK" AND O(2)=1 THEN ? "TH
   E COVER SAYS 'ISLE HISTORY'.MANY PAGES
    ARE MISSING.":GOTO 470
YO 280 IF N$="BOOK" AND X=3 AND Y=3 THEN
   ? "THE COVER SAYS 'ISLE HISTORY'.MANY
   PAGES ARE MISSING.":GOTO 470
NL 285 IF N$="CUTLASS" AND O(3)=1 THEN ?
   "IT LOOKS REAL SHARP.":GOTO 55
HJ 290 IF N$="CUTLASS" AND X=4 AND Y=4 TH
   EN ? "IT LOOKS REAL SHARP.":GOTO 55
EO 295 IF N$="APPLE" AND O(4)=1 THEN ? "I
   T LOOKS GOOD TO EAT.":GOTO 55
XU 300 IF N$="APPLE" AND X=2 AND Y=2 THEN
    ? "IT LOOKS GOOD TO EAT.":GOTO 55
FW 305 IF N$="TALISMAN" AND O(5)=1 THEN ?
    "ITS USE IS A TOTAL MYSTERY TO YOU.":
   GOTO 55
OH 310 IF N$="TALISMAN" AND X=2 AND Y=3 T
   HEN ? "ITS USE IS A TOTAL MYSTERY TO Y
   OU.":GOTO 55
HH 315 IF N$="CHEST" AND X=4 AND Y=4 THEN
    ? "INSCRIBED INSIDE IS 'G- TO T-E N-R
   T- BEA-H'.":GOTO 465
CM 317 ? "I DON'T KNOW THAT OBJECT!":GOT
   O 55
XF 320 ? :? "COMPLETE LIST OF VERBS"
DC 325 ? :? "GO GET USE EXAMIN INFO"
KL 330 ? :? "LIST OF OBJECTS FOUND":?
KV 335 IF O(1)=1 THEN ? "DEAD RAT,";
MP 340 IF O(2)=1 THEN ? "BOOK,";
FB 345 IF O(3)=1 THEN ? "CUTLASS,";
OJ 350 IF O(4)=1 THEN ? "APPLE,";
KT 355 IF O(5)=1 THEN ? "MAGIC TALISMAN";
DH 365 ?
ZL 370 ? :? "LIST OF CLUES FOUND":?
ZZ 375 IF F(1)=1 THEN RESTORE 1000:READ B
   $:? "THE BOOK SAYS:";:? B$
```

```
KZ 380 IF F(2)=1 THEN ? "YOU HAVE SCARED
   OFF THE TROLL."
VM 385 IF F(3)=1 THEN ? "CARVED ON THE OA
   K TREE IS:  U-T-R"
LE 390 IF F(4)=1 THEN ? "CARVED ON THE AP
   PLE TREE IS:S-H-A"
WB 395 IF F(5)=1 THEN ? "CARVED ON THE PA
   LM TREE IS: E-E-T"
WV 400 IF F(6)=1 THEN ? "INSCRIBED INSIDE
    THE CHEST IS 'G- TO T-E N-RT- BEA-H'.
   "
KX 405 IF F(7)=1 THEN ? "THE BOOK IS CALL
   ED 'ISLE HISTORY'."
OQ 407 IF F(8)=1 THEN ? "ROLLIN THE MAGIC
   IAN WAS RIGHT."
SY 410 GOTO 55
XN 415 IF F(2)=1 THEN 40
ON 420 ? "A TROLL PUSHES YOU BACK!":X=3:Y
   =4:FOR QQ=1 TO 1000:NEXT QQ:GOTO 15
HA 425 IF X=5 AND Y=2 AND O(1)=1 THEN O$=
   "NOTHING":RETURN
HL 430 IF X=3 AND Y=3 AND O(2)=1 THEN O$=
   "NOTHING":RETURN
KC 435 IF X=4 AND Y=4 AND O(3)=1 THEN O$=
   "NOTHING":RETURN
KD 440 IF X=2 AND Y=3 AND O(5)=1 THEN O$=
   "NOTHING":RETURN
ZX 445 RETURN
UF 450 F(3)=1:GOTO 55
VB 455 F(4)=1:GOTO 55
UV 460 F(5)=1:GOTO 55
VR 465 F(6)=1:GOTO 55
VL 470 F(7)=1:GOTO 55
VY 472 F(8)=1:GOTO 55
FL 475 ? :? "***CONGRATULATIONS!***"
EB 480 ? :? "YOU HAVE ESCAPED FROM BARNAB
   Y'S ISLE."
ZS 495 ? "WITH A POINTS SCORE OF:";
HC 500 FOR QQ=1 TO 8:IF F(QQ)=1 THEN SCOR
   E=SCORE+2:NEXT QQ
QY 505 FOR QQ=1 TO 5:IF O(QQ)=1 THEN SCOR
   E=SCORE+4:NEXT QQ
HY 510 TIMES=100/(16+20):PERCENT=SCORE*TI
   MES:PERCENT=INT(PERCENT)
MN 515 ? SCORE;" AND A PERCENTAGE OF ";PE
   RCENT;"%"
NY 520 END
UX 600 POKE 77,0:IF BRK THEN POKE 16,112:
   POKE 53774,112
ZE 610 RETURN
KX 1000 DATA "SO ROLLIN THE MAGICIAN HID
   HIS TREASURE IN THE OLD OAK TREE & WEN
   T TO PROVE TROLLS FEAR OF RATS."
SG 10000 DATA 3,1,SOUTH BEACH.A BEATEN TR
   ACK LEADS        NORTH.TALL CLIFFS LOOM
   UP ON EITHER     SIDE.,■,NOOO
AY 10001 DATA 4,1,PALM TREE.A LITTLE PALM
    TREE SITS       ALONE OVERLOOKING THE C
   LIFF.,■,NOOO
KS 10002 DATA 1,2,SUNKING'S COVE.VICIOUS
   ROCKS SURROUND THIS ROUGH COVE.,■,OOEO
YL 10003 DATA 2,2,APPLE TREE.A QUIET APPL
   E TREE RESTS IN A CLEARING IN THE SCRU
   B.,APPLE,OOEW
ZV 10004 DATA 3,2,CROSSROADS.HERE THE PAT
   H SPLITS INTO  THREE OTHER DIRECTIONS.
   ,■,NSEW
HA 10005 DATA 4,2,ROLLIN'S HILL.A SMALL P
   EACEFUL HILL    RISES UP OUT OF THE GRO
   UND.,■,NSEW
PN 10006 DATA 5,2,OPEN GRAVE.A GRAVE HAS
   BEEN DUG HERE  BUT THE OWNER IS NOWHER
   E TO BE SEEN.,DEAD RAT,OOOW
FE 10007 DATA 2,3,OLD OAK TREE.AN ANCIENT
    OAK TREE RISES OUT OF THE GROUND AHEA
   D.,MAGIC TALISMAN,OOEO
ZD 10008 DATA 3,3,SHACK.A FORLORN SHACK S
   TANDS IN A       CLEARING BEFORE YOU.,BO
   OK,NSEW
JJ 10009 DATA 4,3,ARNIE'S RIVER.NEXT TO Y
   OU LIES A        LITTLE RIVER.,■,NSEW
YJ 10010 DATA 5,3,WATERFALL.A WATERFALL F
   ALLS DOWN FROM HERE TO THE SEA.,■,OOOW
GL 10011 DATA 2,4,WHEAT FIELD.WHEAT STALK
   S DANCE MERRILY IN THE SUNSHINE.,■,OOE
   O
TK 10012 DATA 3,4,DEAD MAN'S SWAMP.A TERR
   IBLE SWAMP LIES HERE.TO THE NORTH YOU
   CAN SEE          SOMETHING ODD.,■,NSEW
PN 10013 DATA 4,4,PIRATE'S TREASURE.AN OP
   EN CHEST LIES    ON THE GROUND.,CUTLASS,
   OSOW
FR 10014 DATA 3,5,NORTH BEACH.YOU ARE FIN
   ALLY HERE!A      BOAT LIES NEAR THE SHOR
   E.,■,OSOO
```

PEEK AND POKE POWER FROM DOS

MINIMON

Article on page 20

LISTING 1

Don't type the TYPO II Codes!

```
CL 10 REM MINIMON
NW 20 REM BY JOE KIMBROUGH
GD 30 REM (c) 1985,1988 ANTIC PUBLISHING
EV 40 REM (LINES 10-250 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IJ 50 REM CHANGE LINE 70 AS NECESSARY.)
PR 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
   EEK(10592):POKE 10592,255
EN 70 FN$="D1:MINIMON.EXE":REM THIS IS TH
   E NAME OF THE DISK FILE TO BE CREATED
RD 80 ? "Disk or Cassette?";:POKE 764,25
   5
PY 90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
   58) THEN 90
TH 100 IF PEEK(764)=18 THEN FN$="C:"
VB 110 POKE 764,255:GRAPHICS 0:? "      AN
   TIC'S GENERIC BASIC LOADER"
MY 120 ? ,"BY CHARLES JACKSON"
KB 130 POKE 10592,DPL:TRAP 200
PU 140 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LW 150 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BQ 160 AR$="":READ AR$
YC 170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DM 180 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")          "
BK 190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 160
MM 200 IF PEEK(195)=5 THEN ? :? :? "TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CM 210 IF C<LN+1 THEN ? :? "TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
UQ 220 IF FN$="C:" THEN ? :? " Prepare ca
   ssette, press [RETURN]"
AR 230 OPEN #1,8,0,FN$
PV 240 POKE 766,1:? #1;A$;:POKE 766,0
AL 250 CLOSE #1:GRAPHICS 0:? "■COMPLETED■
   "
MS 1000 DATA 687
NQ 1010 DATA 25525500000522510521732162522
   011622080181692261411142053169164141161
   053169246141143053141162053
IM 1020 DATA 1600001851660530321580532001
   92086208245169021133085169012133084169
   032032158053032139053201049
VR 1030 DATA 2080030760780522010502080030
   76158052201051208222169012141252002096
   160005169000153000005136208
CY 1040 DATA 2501600001852520530321580532
   00192059208245169020133085169001133084
   169032032158053169003133207
GY 1050 DATA 0320440531652042082091652031
   33206169020133085169003133084169032032
```

continued on next page

```
   |1580531690051332070320440 53
BF |1060 DATA 16000016520614520307607805216000516900015300000513620825016000018505505403215805320019210020 8
FD |1070 DATA 2451690161330851690021330841690320321580531690051332070320440531690161330851690041330841690 32
CF |1080 DATA 032158053160000177203133212169000133213032170217032230216173128005201048208003238243052160000
RN |1090 DATA 185128005201128144002073128201252052247053046240008032158053200192007208235169128141243052160
CF |1100 DATA 006169032153128005136208250169155032158053173031208201003208003076025052201006208242076158052
PQ |1110 DATA 160000032139053201027208005104104076025052201155240049201126208018170136169000153000005138192
RZ |1120 DATA 255240222032158053076046053201058176214201048144210196207208005169155076111053032158053153000
OZ |1130 DATA 005200076046053032158053169000133242133243169005133244032000216032210217165212133203165213133
NA |1140 DATA 204096132205032253242201160144002073128162000142182002164205096132205032176242164205096125155
WD |1150 DATA 032032032032032032032032032032196207211160208197197203175208207203197155155155155155127177032
NY |1160 DATA 068079083080079075069155155127178032068079083080069069075155155127179032069088073084032084079
TY |1170 DATA 032068079083155155127089111171114032099104111105099101248053154054058032032155125155080111107
YM |1180 DATA 101032116104101032105110116101103101114058155155073110116111032116104101032097100100114101115
BT |1190 DATA 115058155155155080114101115115032197211195032116111032101120105116155125091080114101115115032
IO |1200 DATA 197211195032116111032097098111114116032105110112117116093155155080101110107032097100100114101
QU |1210 DATA 115115058155155072111108100150321101171090981011140581551551552072082122012072060320770971 05
IL |1220 DATA 110032109101110117155155211212193210212032032082101045114117110032068079083080069069075155224
HU |1230 DATA 002225002000052
```

LISTING 2

```
0100 ; MINIMON
0110 ; BY JOE KIMBROUGH
0120 ; (c)1988, ANTIC PUBLISHING INC.
0130 AFP =    $D800
0140 BUFF1 = $0500
0150 CH   =   $02FC
0160 COLCRS = $55
0170 CONSOL = $D01F
0180 EOL =    $9B
0190 FASC =   $D8E6
0200 FPI =    $D9D2
0210 IFP =    $D9AA
0220 INVFLG = $02B6
0230 KGB =    $F2FD
0240 OUTCHAR = $F2B0
0250 PR2 =    $34F3
0260 ROWCRS = $54
0270 ;
0280      *=  $3400
0290 STARTCODE
0300      LDA $FCD8    ;800 or XL/XE?
0310      CMP #$A2
0320      BNE MAIN.MENU ;If not 800
                        then proceed
0330      LDA #$E2
0340      STA OS.MOD.1+1
0350      LDA #$A4
0360      STA OS.MOD.2+1
0370      LDA #$F6
0380      STA OS.MOD.1+2
0390      STA OS.MOD.2+2
0400 MAIN.MENU
0410      LDY #$00
0420 LOOP.1
0430      LDA MENU.TEXT,Y ;Print main
                          menu
0440      JSR PRINT.CHAR
0450      INY
0460      CPY #$56
0470      BNE LOOP.1
0480 ;
0490 PUTCUR
0500      LDA #$15     ;Place cursor
0510      STA COLCRS
0520      LDA #$0C
0530      STA ROWCRS
0540      LDA #$20
0550      JSR PRINT.CHAR
0560      JSR GET.CHAR ;Get menu choice
0570      CMP #'1
0580      BNE DPE1
0590 ;
0600      JMP DOSPOKE ;Go to DOSPOKE
0610 ;
0620 DPE1
0630      CMP #$32
0640      BNE DPE2
0650 ;
0660      JMP DOSPEEK ;Go to DOSPEEK
0670 ;
0680 DPE2
0690      CMP #'3
0700      BNE PUTCUR
0710 ;
0720      LDA #$0C     ;Store keycode
                       for EOL in CH for
0730      STA CH       ;auto-[RETURN]
                       after going back
                       to DOS
0740      RTS
0750 ;
0760 DOSPOKE
0770      LDY #$05     ;Clear ASCII
                        input buffer
0780      LDA #$00
0790 LOOP.2
0800      STA BUFF1,Y
0810      DEY
0820      BNE LOOP.2
0830 ;
0840      LDY #$00
0850 LOOP.3
0860      LDA DOSPOKE.TEXT,Y ;Print
                 DOSPOKE screen
0870      JSR PRINT.CHAR
0880      INY
0890      CPY #$3B
0900      BNE LOOP.3
0910 ;
0920      LDA #$14     ;Place cursor
0930      STA COLCRS
0940      LDA #$01
0950      STA ROWCRS
0960      LDA #$20
0970      JSR PRINT.CHAR
0980      LDA #$03     ;Limit input
                        to 3 digits
0990      STA $CF
1000      JSR KEYBD.INP ;Get POKE value
                   [ASC->INT]
1010      LDA $CC      ;Hi-byte > $FF ?
1020      BNE DOSPOKE ;If not 0, then
                   start over.
1030      LDA $CB      ;Store low byte
1040      STA $CE
1050      LDA #$14     ;Place cursor
1060      STA COLCRS
1070      LDA #$03
1080      STA ROWCRS
1090      LDA #$20
1100      JSR PRINT.CHAR
1110      LDA #$05     ;Limit input to
                       5 digits
1120      STA $CF
1130      JSR KEYBD.INP ;Get address
                   [ASC->INT]
1140      LDY #$00
1150      LDA $CE      ;Get stored INT
1160      STA ($CB),Y ;Put in addr.
1170      JMP DOSPOKE ;Go back
1180 ;
1190 DOSPEEK
1200      LDY #$05     ;Clear ASCII
                        input buffer
1210      LDA #$00
1220 LOOP.4
1230      STA BUFF1,Y
1240      DEY
```

```
1250        BNE LOOP.4
1260  ;
1270        LDY #$00
1280  LOOP.5
1290        LDA DOSPEEK.TEXT,Y ;Print
                       DOSPEEK screen
1300        JSR PRINT.CHAR
1310        INY
1320        CPY #$64
1330        BNE LOOP.5
1340  ;
1350        LDA #$10      ;Place cursor
1360        STA COLCRS
1370        LDA #$02
1380        STA ROWCRS
1390        LDA #$20
1400        JSR PRINT.CHAR
1410        LDA #$05      ;Limit input to
                           5 digits
1420        STA $CF
1430        JSR KEYBD.INP ;Get address
                          [ASC->INT]
1440        LDA #$10      ;Place cursor
1450        STA COLCRS
1460        LDA #$04
1470        STA ROWCRS
1480        LDA #$20
1490        JSR PRINT.CHAR
1500        LDY #$00
1510        LDA ($CB),Y ;Get contents
                         of address
1520        STA $D4       ;Store lo-byte
                           in FR0
1530        LDA #$00
1540        STA $D5       ;Put $00 in
                           high byte FR0
1550        JSR IFP       ;Convert INT->FP
1560        JSR FASC      ;Convert FP->ASC
1570        LDA $0580     ;Print ASCII
1580        CMP #$30
1590        BNE PR1
1600  ;
1610        INC PR2
1620  PR1
1630        LDY #$00
1640  CPJ3
1650        LDA $0580,Y
1660        CMP #$80
1670        BCC CPJ1
1680  ;
1690        EOR #$80
1700  CPJ1
1710        CMP #$2E
1720        BEQ CPJ2
1730  ;
1740        JSR PRINT.CHAR
1750        INY
1760        CPY #$07
1770        BNE CPJ3
1780  ;
1790  CPJ2
1800        LDA #$80
1810        STA PR2
1820        LDY #$06      ;Clear ASCII
                           output buffer
1830        LDA #$20
1840  LOOP.6
1850        STA $0580,Y
1860        DEY
1870        BNE LOOP.6
1880  ;
1890        LDA #$9B
1900        JSR PRINT.CHAR
1910  CHECK.CONSOLE
1920        LDA CONSOL   ;Check console
                          keys
1930        CMP #$03     ;Is it OPTION?
1940        BNE CHECK.START
1950  ;
1960        JMP MAIN.MENU
1970  ;
1980  CHECK.START
1990        CMP #$06      ;Is it START?
2000        BNE CHECK.CONSOLE
2010  ;
2020        JMP DOSPEEK ;Re-run DOSPEEK
2030  ;
2040  ; ------------------------------
2050  ; Keyboard Input/ASCII->Integer
2060  ; ------------------------------
2070  KEYBD.INP
2080        LDY #$00
2090  GET.KEY
2100        JSR GET.CHAR ;Get a key
2110        CMP #$1B      ;Is it ESC?
2120        BNE CPJ4      ;If not, go on
2130  ;
2140        PLA           ;Clear stack of
2150        PLA           ;return addr.
2160        JMP MAIN.MENU
2170  CPJ4
2180        CMP #$9B
2190        BEQ END.OF.LINE
2200  ;
2210        CMP #$7E      ;Backspace
2220        BNE CHK9
2230  ;
2240        TAX
2250        DEY
2260        LDA #$00
2270        STA BUFF1,Y
2280        TXA
2290        CPY #$FF      ; Limit cursor
                            travel
2300        BEQ KEYBD.INP
2310  ;
2320        JSR PRINT.CHAR
2330        JMP GET.KEY
2340  ;
2350  CHK9
2360        CMP #$3A      ; Is it >9?
2370        BCS GET.KEY ; If so, go back
2380  ;
2390        CMP #$30      ; Is it <0?
2400        BCC GET.KEY ; If so, go back
2410  ;
2420        CPY $CF       ;Check inp limit
2430        BNE DO.BUFFR
2440  ;
2450        LDA #$9B
2460        JMP END.OF.LINE
2470  ;
2480  DO.BUFFR
2490        JSR PRINT.CHAR
2500        STA BUFF1,Y ; Store digit in
                          ASCII buffer
2510        INY
2520        JMP GET.KEY
2530  ;
2540  END.OF.LINE
2550        JSR PRINT.CHAR
2560        LDA #$00      ;Set up FR0
2570        STA $F2
2580        STA $F3
2590        LDA #$05
2600        STA $F4
2610        JSR AFP            ; ASC -> FP
2620        JSR FPI            ; FP -> INT
2630        LDA $D4            ; Get lo-byte
2640        STA $CB
2650        LDA $D5            ; Get hi-byte
2660        STA $CC
2670        RTS
2680  ;
2690  ;---------------
2700  ; I/O ROUTINES
2710  ;---------------
2720  GET.CHAR
2730        STY $CD            ;Save Y
2740  OS.MOD.1
2750        JSR KGB            ;Get char
2760        CMP #$A0           ;Inverse video?
2770        BCC NO.INV.VIDEO
2780  ;
2790        EOR #$80           ;Fix inv. video
2800  NO.INV.VIDEO
2810        LDX #$00           ;Disable inverse
                                video key
2820        STX INVFLG
2830        LDY $CD            ;Restore Y
2840        RTS
2850  ;
2860  PRINT.CHAR
2870        STY $CD            ;Save Y
2880  OS.MOD.2
2890        JSR OUTCHAR ;Print char
2900        LDY $CD     ;Restore Y
2910        RTS
2920  ;
2930  ; ------ TEXT --------
2940  ;
2950  MENU.TEXT
2960        .BYTE "■",EOL
2970        .BYTE "                DOS■"
```

continued on next page

```
2980        .BYTE "PEEK/POKE",EOL,EOL
2990        .BYTE EOL,EOL,EOL
3000        .BYTE "▯1 DOSPOKE",EOL,EOL
3010        .BYTE "▯2 DOSPEEK",EOL,EOL
3020        .BYTE "▯3 EXIT TO DOS",EOL,EO
L
3030        .BYTE "▯Your choice:  ",EOL
3040 DOSPOKE.TEXT
3050        .BYTE "▯",EOL
3060        .BYTE "Poke the integer:",EOL
,EOL
3070        .BYTE "Into the address:",EOL
,EOL,EOL
3080        .BYTE "Press ESC to exit",EOL
3090 DOSPEEK.TEXT
3100        .BYTE "▯[Press ESC to abort i
nput]",EOL,EOL
3110        .BYTE "Peek address:",EOL,EOL

3120        .BYTE "Holds number:",EOL,EOL
,EOL
3130        .BYTE "OPTION Main menu",EOL,
EOL
3140        .BYTE "START  Re-run DOSPEEK"
,EOL
3150        *=  $02E0
3160        .WORD STARTCODE
3170        .END
```

CHEMISTRY TUTORING FROM YOUR ATARI

PERIODIC MADNESS

Article on page 8

LISTING 1

Don't type the TYPO II Codes!

```
KB 2 REM PERIODIC MADNESS
MM 4 REM BY MARC LeBEAU
OS 6 REM (c)1988, ANTIC PUBLISHING INC.
ME 8 REM (DO NOT RENUMBER THIS PROGRAM!!)
RQ 10 GOSUB 950:POKE 764,255:POKE 710,6:P
   OKE 752,1:GOSUB 20:GOSUB 100:? "
         by MARC LeBEAU":GOTO 30
ZU 20 ? "▯":? "▮▮▮▮▮▮▮▮▮▮▮▯PERIODIC MADNES
   S▯▮▮▮▮▮▮▮▮▮▮▮":RETURN
YX 30 GOSUB 300:REM PLAY TUNE
SM 40 GOSUB 20
DI 50 ? :? :? :? :? :? "           CHOOSE
    SKILL LEVEL:"
GK 60 ? :? "              1) SYMBOL ---> NAME
   ":? "           2) NAME ---> SYMBOL":?
   "        3) NAME ---> MASS"
PQ 69 POKE 764,255
CI 70 A=PEEK(764):IF A=255 THEN 70
BP 75 IF A=31 THEN SL=1:GOTO 400
BQ 80 IF A=30 THEN SL=2:GOTO 400
ET 85 IF A=26 THEN SL=3:GOTO 400
TS 90 GOTO 70
XH 100 REM DRAW PERIODIC TABLE
FF 105 ? "▯▯▯
      ▯▯▯"
RQ 110 ? "▯ ▯
      ▯ ▯"
BC 120 ? "▯▯▯▯▯                    ▯▯▯▯▯▯▯
   ▯▯▯▯▯▯"
VE 130 ? "▯ ▯ ▯                    ▯ ▯ ▯ ▯
   ▯ ▯ ▯"
KI 140 ? "▯▯▯▯▯                    ▯▯▯▯▯▯▯
   ▯▯▯▯▯▯"
VI 150 ? "▯ ▯ ▯                    ▯ ▯ ▯ ▯
   ▯ ▯ ▯"
IO 160 ? "▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯
   ▯▯▯▯▯▯"
UC 170 ? "▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
   ▯ ▯ ▯"
EG 180 ? "▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯
   ▯▯▯▯▯▯"
UG 190 ? "▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
   ▯ ▯ ▯"
DR 200 ? "▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯
   ▯▯▯▯▯▯"
TR 210 ? "▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
   ▯ ▯ ▯"
VR 220 ? "▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯
   ▯▯▯▯▯▯"
BV 230 ? "▯ ▯ ▯ ▯ ▯ ▯ ▯"
QZ 240 ? "▯▯▯▯▯▯▯▯▯▯▯▯▯▯"
NX 250 ? "            ▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯
   ▯▯▯▯▯▯"
UJ 260 ? "            ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
   ▯ ▯ ▯"
UN 270 ? "            ▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯
   ▯▯▯▯▯▯"
UN 280 ? "            ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
   ▯ ▯ ▯"
FJ 290 ? "            ▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯
   ▯▯▯▯▯▯"
AF 295 RETURN
GB 300 REM MUSIC
WG 305 RESTORE 370
VP 310 SOUND 0,0,0,0
SC 320 READ PITCH,LENGTH
EC 330 SOUND 0,PITCH,10,8
GL 332 IF PITCH=0 THEN SOUND 0,0,0,0
IW 335 FOR DELAY=1 TO LENGTH
XX 340 NEXT DELAY:IF PEEK(764)=33 THEN 36
   0
RJ 344 SOUND 0,0,0,0:FOR DY=1 TO 5:NEXT D
   Y
PX 345 IF LENGTH=100 THEN 360
NI 350 GOTO 320
DC 360 POKE 764,255:SOUND 0,0,0,0:RETURN
EP 370 DATA 102,40,76,60,76,65,85,15,68,6
   5,85,40,76,65,102,65,0,50
OC 375 DATA 102,40,76,60,76,65,85,15,68,6
   5,85,55,76,70,0,75
ER 380 DATA 102,40,76,60,76,65,85,15,68,6
   5,85,40,76,65,102,65,0,50
XK 390 DATA 102,65,76,15,76,15,76,65,0,15
   ,85,65,85,25,76,100
CG 400 REM INITIALIZE
PK 410 DIM Q$(13),A1$(13),A2$(13),A3$(13)
   ,AZ$(13),OK$(105),OK1$(105)
RS 415 OK1$(1)="X":OK1$(105)=OK1$:OK1$(2)
   =OK1$
UV 420 MARK=0:Y=0:X=0:YES=0:NO=0:PERCENT=
   0:OK$(1)="W":OK$(105)=OK$:OK$(2)=OK$:F
   LAG=0
YU 430 QNUM=INT(RND(0)*105+1):IF OK$(QNUM
   ,QNUM)="X" THEN 430
NS 431 PQR=10*(QNUM*3+(SL-3))+1010:RESTOR
   E PQR
XR 432 READ MARK,Q$,A1$,A2$,A3$,AZ,Y,X
EQ 435 IF MARK<>SL THEN 430
ZG 440 IF AZ=31 THEN AZ$=A1$
ZU 450 IF AZ=30 THEN AZ$=A2$
DD 460 IF AZ=26 THEN AZ$=A3$
BD 500 REM QUESTION SCREEN
YU 510 POKE 710,2:POKE 709,152
FA 520 ? "▯":GOSUB 20
QR 530 ? :? " # CORRECT = ";YES;,;"# INCO
   RRECT = ";NO
QN 540 POSITION 12,4:? "% CORRECT = ";PER
   CENT
MW 550 ON SL GOTO 560,570,580
JS 560 POSITION 7,10:? "The symbol ";Q$;"
    stands for:"
GR 565 POSITION 14,12:? "1) ";A1$:POSITIO
   N 14,14:? "2) ";A2$:POSITION 14,16:? "
   3) ";A3$:GOTO 600
ZE 570 POSITION 4,10:? "The symbol for ";
   Q$;" is:"
VH 575 POSITION 17,12:? "1) ";A1$:POSITIO
   N 17,14:? "2) ";A2$:POSITION 17,16:? "
   3) ";A3$:GOTO 600
GZ 580 POSITION 6,10:? "The mass of ";Q$;
   " is:"
QN 585 POSITION 16,12:? "1) ";A1$:POSITIO
   N 16,14:? "2) ";A2$:POSITION 16,16:? "
   3) ";A3$:GOTO 600
PT 600 REM GET ANSWER
XB 605 POKE 764,255
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DK 610 A=PEEK(764):IF A=255 THEN 610
TR 615 IF A=31 OR A=30 OR A=26 THEN 620
OR 617 GOTO 610
WP 620 IF A=AZ THEN YES=YES+1:PERCENT=INT
   ((YES/(YES+NO))*100):GOTO 650
ZM 630 IF A<>AZ THEN NO=NO+1:PERCENT=INT(
   (YES/(YES+NO))*100):GOTO 700
HG 650 REM CORRECT ANSWER SCREEN
VI 655 POKE 709,154:POKE 710,6:POKE 752,1
   :? "■":GOSUB 20:GOSUB 100
CX 660 SOUND 0,50,10,8:FOR S=1 TO 100:NEX
   T S:SOUND 0,0,0,0
HD 665 POSITION 14,3:? "RIGHT":OK$(QNUM,Q
   NUM)=CHR$(ASC(OK$(QNUM,QNUM))+1)
YA 667 Q=16-(INT(LEN(AZ$)/2))
AI 668 POSITION Q,5:? AZ$
RH 670 POSITION Y,X:? "X":IF OK$=OK1$ THE
   N FLAG=1
LU 680 FOR DELAY=1 TO 500:NEXT DELAY:IF F
   LAG=1 THEN 800
OO 690 GOTO 430
WA 700 REM INCORRECT ANSWER SCREEN
UZ 705 POKE 709,154:POKE 710,6:POKE 752,1
   :? "■":GOSUB 20:GOSUB 100
QJ 710 SOUND 0,50,6,8:FOR S=1 TO 100:NEXT
    S:SOUND 0,0,0,0
ZD 715 POSITION 14,3:? "WRONG":OK$(QNUM,Q
   NUM)="V"
XR 717 Q=16-(INT(LEN(AZ$)/2))
ZZ 718 POSITION Q,5:? AZ$
XV 720 POSITION Y,X:? "X"
LY 725 FOR DELAY=1 TO 500:NEXT DELAY:IF F
   LAG=1 THEN 800
OD 730 GOTO 430
EB 800 REM FINAL SCREEN
ZL 810 GRAPHICS 18
ZL 815 ? #6;"   % CORRECT = ";PERCENT;"%"
YR 820 IF PERCENT>=80 THEN 850
YL 830 IF PERCENT>=60 THEN 860
XO 840 IF PERCENT>=30 THEN 870
SM 845 GOTO 880
JM 850 POSITION 6,4:? #6;"FANTASTIC":GOTO
    900
XY 860 POSITION 6,4:? #6;"GOOD JOB":GOTO
   900
SQ 870 POSITION 2,4:? #6;"better work har
   der":GOTO 900
CI 880 POSITION 4,3:? #6;"try again,"
ED 890 POSITION 5,4:? #6;"and again,":POS
   ITION 6,5:? #6;"and again,":POSITION 7
   ,6:? #6;"and....":GOTO 900
ZJ 900 GOSUB 300:POSITION 2,8:? #6;"PLAY
   AGAIN (Y/N)?"
XE 905 POKE 764,255
HC 910 A=PEEK(764):IF A=255 THEN 910
LZ 920 IF A=43 THEN GRAPHICS 0:RUN
OO 930 IF A=35 THEN POKE 764,255:END
PJ 940 GOTO 910
VE 950 REM BREAK DISABLE
OR 960 POKE 1536,169:POKE 1537,128
JT 970 POKE 1538,133:POKE 1539,77
TF 980 POKE 1540,104:POKE 1541,64
JH 990 POKE 567,INT(1536/256)
ZR 994 POKE 566,1536-PEEK(567)*256
AP 996 RETURN
PQ 1000 REM DATA STATEMENTS
WX 1010 REM MARK,Q$,A1$,A2$,A3$,AZ,Y,X
EV 1020 DATA 1,Ho,Hydrogen,Holmium,Hahniu
   m,30,29,18
XK 1030 DATA 2,Chromium,Ch,Cr,Co,30,13,9
NE 1040 DATA 3,Rubidium,65.38,85.47,183.9
   ,30,3,11
VS 1050 DATA 1,He,Hydrogen,Helium,Holmium
   ,30,37,3
LR 1060 DATA 2,Zirconium,Zi,Zc,Zr,26,9,11
GB 1070 DATA 3,Gold,197.0,251,50.94,31,23
   ,13
ZB 1080 DATA 1,Sn,Tin,Sulfur,Strontium,31
   ,29,11
MM 1090 DATA 2,Boron,Bo,Bn,B,26,27,5
OZ 1100 DATA 3,Argon,4.003,222,39.95,26,3
   7,7
BI 1110 DATA 1,Si,Sodium,Silicon,Einstein
   ium,30,29,7
EX 1120 DATA 2,Neptunium,Ne,Np,Nt,30,17,2
   0
RN 1130 DATA 3,Fermium,112.4,28.09,257,26
   ,31,20
KZ 1140 DATA 1,U,Xenon,Mercury,Uranium,26
   ,15,20
CC 1150 DATA 2,Zinc,Zi,Zn,Pb,30,25,9
OM 1160 DATA 3,Arsenic,74.92,204.4,39.10,
   31,31,9
LK 1170 DATA 1,Tc,Thulium,Tellurium,Techn
   etium,26,15,11
UJ 1180 DATA 2,Gold,Go,Au,Gd,30,23,13
FJ 1190 DATA 3,Krypton,83.80,192.2,175.0,
   31,37,9
MW 1200 DATA 1,Au,Astatine,Gold,Silver,30
   ,23,13
IW 1210 DATA 2,Einsteinium,Es,Ei,En,31,29
   ,20
KJ 1220 DATA 3,Curium,152.0,247,145,30,23
   ,20
EL 1230 DATA 1,Lr,Lawrencium,Lanthanum,Tu
   ngsten,31,37,20
KN 1240 DATA 2,Magnesium,Mn,Ma,Mg,26,5,7
JV 1250 DATA 3,Tin,118.7,35.45,9.012,31,2
   9,11
VF 1260 DATA 1,Ni,Nickel,Sodium,Nitrogen,
   31,21,9
LE 1270 DATA 2,Tin,Sn,Ti,Tn,31,29,11
ZD 1280 DATA 3,Hydrogen,4.003,91.22,1.008
   ,26,3,3
GT 1290 DATA 1,Hf,Hahnium,Hafnium,Mercury
   ,30,9,13
AD 1300 DATA 2,Thallium,Th,Tl,Tm,30,27,13
GK 1310 DATA 3,Sodium,47.90,101.1,22.99,2
   6,3,7
EO 1320 DATA 1,Ga,Gallium,Germanium,Gold,
   31,27,9
VJ 1330 DATA 2,Erbium,Er,Eb,Em,31,31,18
XX 1340 DATA 3,Scandium,98.91,44.96,12.01
   ,30,7,9
LO 1350 DATA 1,N,Nickel,Nitrogen,Neodymiu
   m,30,31,5
WK 1360 DATA 2,Phosphorus,P,Ph,Ps,31,31,7
YV 1370 DATA 3,Gallium,69.72,131.3,19.00,
   31,27,9
OR 1380 DATA 1,Dy,Polonium,Uranium,Dyspro
   sium,26,27,18
FR 1390 DATA 2,Selenium,Se,S,Sl,31,33,9
CT 1400 DATA 3,Niobium,92.91,58.93,207.2,
   31,11,11
LY 1410 DATA 1,Ba,Boron,Beryllium,Barium,
   26,5,13
KD 1420 DATA 2,Gadolinium,Ga,Gd,Ag,30,23,
   18
LC 1430 DATA 3,Antimony,106.4,157.2,121.8
   ,26,31,11
LK 1440 DATA 1,Na,Nitrogen,Sodium,Neon,30
   ,3,7
JG 1450 DATA 2,Nitrogen,Ni,Ng,N,26,31,5
PR 1460 DATA 3,Promethium,200.6,78.96,145
   ,26,17,18
NC 1470 DATA 1,Tm,Thulium,Titanium,Thalli
   um,31,33,18
II 1480 DATA 2,Radium,Rd,R,Ra,26,5,15
ZF 1490 DATA 3,Lutetium,175.0,259,35.45,3
   1,37,18
FN 1500 DATA 1,H,Helium,Hahnium,Hydrogen,
   26,3,3
ZS 1510 DATA 2,Nickel,N,Ni,Au,30,21,9
AF 1520 DATA 3,Thallium,4.003,106.4,204.4
   ,26,27,13
ZE 1530 DATA 1,Ca,Carbon,Calcium,Cadmium,
   30,5,9
WY 1540 DATA 2,Silver,Si,Ag,Sv,30,23,11
ZU 1550 DATA 3,Protactinium,132.9,231.0,1
   92.2,30,13,20
JH 1560 DATA 1,Zr,Zinc,Zirconium,Actinium
   ,30,9,11
HN 1570 DATA 2,Iron,Fe,Ir,Pb,31,17,9
RR 1580 DATA 3,Mendelevium,210,258,168.9,
   30,33,20
HD 1590 DATA 1,Nd,Neodymium,Sodium,Neptun
   ium,31,15,18
HM 1600 DATA 2,Fluorine,F,Fl,Fr,31,35,5
XL 1610 DATA 3,Helium,10.81,28.09,4.003,2
   6,37,3
ES 1620 DATA 1,Mn,Magnesium,Mendelevium,M
   anganese,26,15,9
SL 1630 DATA 2,Thorium,W,T,Th,26,11,20
CT 1640 DATA 3,Magnesium,24.31,58.71,35.4
   5,31,5,7
LB 1650 DATA 1,Sr,Strontium,Sulfur,Samari
   um,31,5,11
ZQ 1660 DATA 2,Molybdenum,Mo,Ml,My,31,13,
   11
HC 1670 DATA 3,Titanium,55.85,195.1,47.90
   ,26,9,9
YA 1680 DATA 1,Ce,Chlorine,Cesium,Cerium,
   26,11,18
QZ 1690 DATA 2,Potassium,Po,P,K,26,3,9
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GG 1700 DATA 3,Germanium,131.3,72.59,55.8
   5,30,29,9
BA 1710 DATA 1,At,Astatine,Actinium,Silve
   r,31,35,13
RJ 1720 DATA 2,Krypton,K,Kr,Ky,30,27,9
NL 1730 DATA 3,Molybdenum,95.94,44.96,20.
   18,31,13,11
NI 1740 DATA 1,Ge,Gallium,Germanium,Gadol
   inium,30,29,9
YF 1750 DATA 2,Osmium,O,Os,Om,30,17,13
HT 1760 DATA 3,Tellurium,127.6,178.5,223,
   31,33,11
SW 1770 DATA 1,F,Iron,Fluorine,Francium,3
   0,35,5
WD 1780 DATA 2,Uranium,U,Ur,Un,31,15,20
BE 1790 DATA 3,Samarium,95.94,150.4,222,3
   0,19,18
DV 1800 DATA 1,Yb,Yttrium,Erbium,Ytterbiu
   m,26,35,18
PI 1810 DATA 2,Indium,I,Id,In,26,27,11
PH 1820 DATA 3,Hafnium,78.96,112.4,178.5,
   26,9,13
KH 1830 DATA 1,Rf,Rutherfordium,Ruthenium
   ,Radium,31,9,15
VC 1840 DATA 2,Tantalum,T,W,Ta,26,11,13
SA 1850 DATA 3,Lead,207.2,118.7,72.59,31,
   29,13
YN 1860 DATA 1,Cs,Selenium,Cesium,Copper,
   30,3,13
YB 1870 DATA 2,Rhodium,Ro,Rd,Rh,26,19,11
HR 1880 DATA 3,Uranium,186.2,144.2,238.0,
   26,15,20
KA 1890 DATA 1,Eu,Erbium,Einsteinium,Euro
   pium,26,21,18
QS 1900 DATA 2,Lawrencium,Lr,La,Lw,31,37,
   20
EH 1910 DATA 3,Nobelium,35.45,126.9,259,2
   6,35,20
YE 1920 DATA 1,Tl,Tantalum,Tellurium,Thal
   lium,26,27,13
MD 1930 DATA 2,Strontium,St,S,Sr,26,5,11
WT 1940 DATA 3,Lithium,22.99,6.941,1.008,
   30,3,5
CM 1950 DATA 1,Ti,Tin,Terbium,Titanium,26
   ,9,9
OK 1960 DATA 2,Chlorine,C,Ch,Cl,26,35,7
JA 1970 DATA 3,Aluminum,26.98,69.72,114.8
   ,31,27,7
IO 1980 DATA 1,Ag,Silver,Gold,Argon,31,23
   ,11
EX 1990 DATA 2,Hahnium,Ha,Hh,Hn,31,11,15
FR 2000 DATA 3,Vanadium,91.22,50.94,69.72
   ,30,11,9
MG 2010 DATA 1,Bk,Bismuth,Beryllium,Berke
   lium,26,25,20
HG 2020 DATA 2,Cesium,Ce,Cs,Cu,30,3,13
EV 2030 DATA 3,Technetium,98.91,54.94,14.
   01,31,15,11
OV 2040 DATA 1,Cu,Copper,Curium,Cerium,31
   ,23,9
RG 2050 DATA 2,Lanthanum,La,Ln,L,31,7,13
PF 2060 DATA 3,Iodine,35.45,79.90,126.9,2
   6,35,11
NX 2070 DATA 1,Fm,Francium,Fluorine,Fermi
   um,26,31,20
DA 2080 DATA 2,Sulfur,S,Su,Sl,31,33,7
UK 2090 DATA 3,Europium,195.1,152.0,243,3
   0,21,18
HN 2100 DATA 1,Es,Europium,Einsteinium,Pr
   otactinium,30,29,20
ZE 2110 DATA 2,Arsenic,Ar,A,As,26,31,9
RI 2120 DATA 3,Tantalum,92.91,180.9,262,3
   0,11,13
AP 2130 DATA 1,Cl,Calcium,Chlorine,Califo
   rnium,30,35,7
YK 2140 DATA 2,Platinum,Pl,Pt,W,30,21,13
IL 2150 DATA 3,Bismuth,209.0,121.8,74.92,
   31,31,13
DG 2160 DATA 1,W,Platinum,Fermium,Tungste
   n,26,13,13
QI 2170 DATA 2,Praseodymium,Pr,Pa,Pd,31,1
   3,18
NZ 2180 DATA 3,Neptunium,145,237.0,254,30
   ,17,20
OV 2190 DATA 1,Nb,Neptunium,Niobium,Nobel
   ium,30,11,11
CM 2200 DATA 2,Aluminum,Al,Am,Sb,31,27,7
EI 2210 DATA 3,Lawrencium,222,175.0,260,2
   6,37,20
XJ 2220 DATA 1,Am,Aluminum,Americium,Acti
   nium,30,21,20
AP 2230 DATA 2,Lutetium,L,Lt,Lu,26,37,18
QG 2240 DATA 3,Beryllium,9.012,24.31,40.0
   8,31,5,5
JD 2250 DATA 1,Xe,Xenon,Uranium,Plutonium
   ,31,37,11
GG 2260 DATA 2,Tellurium,T,Tl,Te,26,33,11
LO 2270 DATA 3,Silicon,12.01,28.09,72.59,
   30,29,7
WE 2280 DATA 1,Ra,Radium,Radon,Rubidium,3
   1,5,15
KH 2290 DATA 2,Silicon,S,Si,Sc,30,29,7
VT 2300 DATA 3,Chromium,183.9,95.94,52.00
   ,26,13,9
CG 2310 DATA 1,Pb,Palladium,Tin,Lead,26,2
   9,13
DF 2320 DATA 2,Germanium,Gr,Ge,Gm,30,29,9
XO 2330 DATA 3,Selenium,16.00,32.06,78.96
   ,26,33,9
PP 2340 DATA 1,Ar,Americium,Arsenic,Argon
   ,26,37,7
DJ 2350 DATA 2,Americium,Am,Ar,Ac,31,21,2
   0
UQ 2360 DATA 3,Ruthenium,55.85,190.2,101.
   1,26,17,11
DJ 2370 DATA 1,Rh,Rhodium,Rutherfordium,R
   uthenium,31,19,11
AA 2380 DATA 2,Neodymium,Ny,Ne,Nd,26,15,1
   8
VO 2390 DATA 3,Xenon,131.3,222,175.0,31,3
   7,11
TO 2400 DATA 1,Mg,Manganese,Magnesium,Mer
   cury,30,5,7
RJ 2410 DATA 2,Holmium,Ho,Hm,Hl,31,29,18
ET 2420 DATA 3,Gadolinium,197.0,157.2,247
   ,30,23,18
WG 2430 DATA 1,C,Copper,Carbon,Calcium,30
   ,29,5
FK 2440 DATA 2,Cadmium,Ca,Cd,Cm,30,25,11
YZ 2450 DATA 3,Tungsten,183.9,95.94,52.00
   ,31,13,13
JG 2460 DATA 1,Cr,Carbon,Curium,Chromium,
   26,13,9
KC 2470 DATA 2,Neon,N,No,Ne,26,37,5
NP 2480 DATA 3,Polonium,210,127.6,78.96,3
   1,33,13
UB 2490 DATA 1,Co,Copper,Cobalt,Carbon,30
   ,19,9
JI 2500 DATA 2,Sodium,Na,S,So,31,3,7
FE 2510 DATA 3,Plutonium,192.2,244,150.4,
   30,19,20
DL 2520 DATA 1,La,Lead,Lanthanum,Lawrenci
   um,30,7,13
ZB 2530 DATA 2,Protactinium,Pa,Pr,Pt,31,1
   3,20
OY 2540 DATA 3,Rutherfordium,257,178.5,91
   .22,31,9,15
CI 2550 DATA 1,Y,Yttrium,Ytterbium,Tungst
   en,31,7,11
DJ 2560 DATA 2,Copper,Co,Cp,Cu,26,23,9
GF 2570 DATA 3,Boron,10.81,26.98,69.72,31
   ,27,5
QC 2580 DATA 1,Np,Neptunium,Niobium,Neody
   mium,31,17,20
VB 2590 DATA 2,Antimony,An,Sb,At,30,31,11
VB 2600 DATA 3,Phosphorus,14.01,30.97,74.
   92,30,31,7
YV 2610 DATA 1,Be,Berkelium,Beryllium,Bro
   mine,30,5,5
JW 2620 DATA 2,Gallium,Ga,Gl,Gu,31,27,9
AW 2630 DATA 3,Manganese,186.2,98.91,54.9
   4,26,15,9
UD 2640 DATA 1,O,Osmium,Nobelium,Oxygen,2
   6,33,5
PR 2650 DATA 2,Hafnium,Ha,Hf,Hn,30,9,13
SA 2660 DATA 3,Bromine,126.9,79.90,35.45,
   30,35,9
RJ 2670 DATA 1,Ne,Nickel,Neon,Neodymium,3
   0,37,5
CZ 2680 DATA 2,Palladium,Pd,Pl,Pa,31,21,1
   1
MB 2690 DATA 3,Rhodium,58.93,102.9,192.2,
   30,19,11
KD 2700 DATA 1,Fe,Fluorine,Iron,Francium,
   30,17,9
TG 2710 DATA 2,Dysprosium,Dy,Ds,Dp,31,27,
   18
SG 2720 DATA 3,Cesium,223,132.9,85.47,30,
   3,13
MH 2730 DATA 1,S,Sodium,Sulfur,Silicon,30
   ,33,7
LH 2740 DATA 2,Cobalt,Cb,Ct,Co,26,19,9
GU 2750 DATA 3,Terbium,158.9,200.6,112.4,
   31,25,18
YQ 2760 DATA 1,Te,Tellurium,Technetium,Te
   rbium,31,33,11
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AR 2770 DATA 2,Oxygen,O,Ox,Oy,31,33,5
EL 2780 DATA 3,Rhenium,186.2,98.91,54.94,
   31,15,13
IJ 2790 DATA 1,Ha,Hafnium,Iridium,Hahnium
   ,26,11,15
GT 2800 DATA 2,Bromine,B,Br,Bo,30,35,9
ZX 2810 DATA 3,Astatine,126.9,210,259,30,
   35,13
SA 2820 DATA 1,Hg,Mercury,Hafnium,Holmium
   ,31,25,13
FM 2830 DATA 2,Yttrium,Yt,Y,Ym,30,7,11
SP 2840 DATA 3,Americium,243,152.0,195.1,
   31,21,20
VD 2850 DATA 1,Br,Boron,Bromine,Barium,30
   ,35,9
MT 2860 DATA 2,Rubidium,Rb,Ru,Rd,31,3,11
BE 2870 DATA 3,Hahnium,92.91,180.91,262,2
   6,11,15
XW 2880 DATA 1,Os,Osmium,Tantalum,Astatin
   e,31,17,13
EJ 2890 DATA 2,Mendelevium,Me,Mn,Md,26,33
   ,20
DP 2900 DATA 3,Carbon,12.01,28.09,72.59,3
   1,29,5
SL 2910 DATA 1,In,Indium,Iodine,Iridium,3
   1,27,11
ZY 2920 DATA 2,Iodine,I,Io,Id,31,35,11
YQ 2930 DATA 3,Sulfur,16.00,32.06,78.96,3
   0,33,7
VZ 2940 DATA 1,Zn,Zinc,Zirconium,Nickel,3
   1,25,9
SZ 2950 DATA 2,Rhenium,Re,Rh,Rn,31,15,13
UV 2960 DATA 3,Iron,55.85,101.1,190.2,31,
   17,9
YV 2970 DATA 1,Se,Scandium,Selenium,Stron
   tium,30,33,9
KE 2980 DATA 2,Berkelium,Be,Bk,Bl,30,25,2
   0
SD 2990 DATA 3,Palladium,59.83,106.4,207.
   19,30,21,11
LO 3000 DATA 1,Kr,Potassium,Molybdenum,Kr
   ypton,26,37,9
GB 3010 DATA 2,Actinium,At,Ac,An,30,7,15
WO 3020 DATA 3,Barium,137.3,87.62,40.08,3
   1,5,13
ZR 3030 DATA 1,Pd,Lead,Plutonium,Palladiu
   m,26,21,11
GD 3040 DATA 2,Ytterbium,Yt,Y,Yb,26,35,18
FT 3050 DATA 3,Dysprosium,114.8,162.5,204
   .4,30,27,18
IM 3060 DATA 1,Sm,Sodium,Samarium,Stronti
   um,30,19,18
PY 3070 DATA 2,Tungsten,W,Tu,Tg,31,13,13
MR 3080 DATA 3,Osmium,55.85,101.1,190.2,2
   6,17,13
ZB 3090 DATA 1,Er,Einsteinium,Europium,Er
   bium,26,31,18
DR 3100 DATA 2,Mercury,Me,Mc,Hg,26,25,13
OK 3110 DATA 3,Radon,260,222,175.0,30,37,
   13
XU 3120 DATA 1,Pt,Protactinium,Plutonium,
   Platinum,26,21,13
DU 3130 DATA 2,Hydrogen,Hy,H,Hd,30,3,3
CV 3140 DATA 3,Nitrogen,12.01,10.81,14.01
   ,26,31,5
YT 3150 DATA 1,Li,Lead,Lutetium,Lithium,2
   6,3,5
BF 3160 DATA 2,Vanadium,V,Va,Vn,31,11,9
JB 3170 DATA 3,Chlorine,19.00,35.45,79.90
   ,30,35,7
GU 3180 DATA 1,Cf,Californium,Francium,Me
   ndelevium,31,27,20
JC 3190 DATA 2,Technetium,Tc,Te,Th,31,15,
   11
RK 3200 DATA 3,Cobalt,192.2,102.9,58.93,2
   6,19,9
OI 3210 DATA 1,K,Krypton,Praseodymium,Pot
   assium,26,3,9
ZD 3220 DATA 2,Radon,R,Ra,Rn,26,37,13
MX 3230 DATA 3,Silver,197.0,107.9,63.55,3
   0,23,11
AS 3240 DATA 1,Pr,Phosphorus,Promethium,P
   raseodymium,26,13,18
QH 3250 DATA 2,Bismuth,B,Bm,Bi,26,31,13
JU 3260 DATA 3,Lanthanum,138.9,88.91,44.9
   6,31,7,13
VR 3270 DATA 1,No,Nobelium,Nitrogen,Neptu
   nium,31,35,20
AC 3280 DATA 2,Carbon,Ca,C,Co,30,29,5
QE 3290 DATA 3,Holmium,254,164.9,118.7,30
   ,29,18
DY 3300 DATA 1,Md,Thorium,Thallium,Mendel
   evium,26,33,20
ZK 3310 DATA 2,Ruthenium,Ru,Rt,Rn,31,17,1
   1
TT 3320 DATA 3,Iridium,58.93,102.9,192.2,
   26,19,13
HE 3330 DATA 1,Rb,Rubidium,Radium,Rhodium
   ,31,3,11
OD 3340 DATA 2,Calcium,Ca,Cl,C,31,5,9
LE 3350 DATA 3,Francium,85.47,132.9,223,2
   6,3,15
YC 3360 DATA 1,Ir,Iodine,Iridium,Indium,3
   0,19,13
XN 3370 DATA 2,Scandium,S,Sc,Sa,30,7,9
NJ 3380 DATA 3,Berkelium,247,158.9,112.4,
   31,25,20
BU 3390 DATA 1,Po,Protactinium,Polonium,P
   otassium,30,33,13
EA 3400 DATA 2,Polonium,Pl,P,Po,26,33,13
MC 3410 DATA 3,Oxygen,78.96,32.06,16.00,2
   6,33,5
IP 3420 DATA 1,B,Beryllium,Boron,Bismuth,
   30,27,5
KP 3430 DATA 2,Lithium,Li,Lt,Lm,31,3,5
LP 3440 DATA 3,Nickel,106.4,58.71,10.81,3
   0,21,9
WE 3450 DATA 1,Al,Aluminum,Antimony,Holmi
   um,31,27,7
VI 3460 DATA 2,Europium,E,Er,Eu,26,21,18
VP 3470 DATA 3,Strontium,87.62,40.08,24.3
   1,31,5,11
TC 3480 DATA 1,Pm,Promethium,Potassium,Pa
   lladium,31,17,18
GU 3490 DATA 2,Titanium,Tt,Ta,Ti,26,9,9
FB 3500 DATA 3,Cadmium,65.38,112.4,200.6,
   30,25,11
XY 3510 DATA 1,Tb,Lead,Tantalum,Terbium,2
   6,25,18
DD 3520 DATA 2,Terbium,Te,Tb,Tr,30,25,18
IC 3530 DATA 3,Cerium,50.94,92.91,140.1,2
   6,11,18
ZA 3540 DATA 1,Ta,Tantalum,Titanium,Techn
   etium,31,11,13
PD 3550 DATA 2,Lead,Le,Pb,Ld,30,29,13
IU 3560 DATA 3,Erbium,167.3,209.0,126.9,3
   1,31,18
ZJ 3570 DATA 1,Ac,Arsenic,Actinium,Americ
   ium,30,7,15
JY 3580 DATA 2,Beryllium,Be,Br,By,31,5,5
RX 3590 DATA 3,Platinum,58.71,106.4,195.1
   ,26,21,13
BV 3600 DATA 1,Rn,Rhenium,Ruthenium,Radon
   ,26,37,13
TP 3610 DATA 2,Niobium,Ni,Nb,No,30,11,11
BA 3620 DATA 3,Radium,226.0,137.3,87.62,3
   1,5,15
SR 3630 DATA 1,Sc,Silicon,Scandium,Silico
   n,30,7,9
LL 3640 DATA 2,Astatine,As,A,At,26,35,13
QB 3650 DATA 3,Californium,251,227,107.9,
   31,27,20
JR 3660 DATA 1,Re,Rhenium,Ruthenium,Ruthe
   rfordium,31,15,13
SI 3670 DATA 2,Manganese,Mg,Ma,Mn,26,15,9
WN 3680 DATA 3,Fluorine,19.00,35.45,10.81
   ,31,35,5
DP 3690 DATA 1,Cm,Curium,Cadmium,Calcium,
   31,23,20
RW 3700 DATA 2,Thulium,Th,Tm,Tl,30,33,18
FG 3710 DATA 3,Potassium,22.99,39.10,85.4
   7,30,3,9
GI 3720 DATA 1,Bi,Bromine,Bismuth,Berkeli
   um,30,31,13
AS 3730 DATA 2,Promethium,Pm,Pr,Po,31,17,
   18
OO 3740 DATA 3,Copper,63.55,107.9,197.0,3
   1,23,9
MM 3750 DATA 1,As,Astatine,Arsenic,Antimo
   ny,30,31,9
SU 3760 DATA 2,Fermium,Fe,Fr,Fm,26,31,20
XS 3770 DATA 3,Yttrium,88.91,138.9,227,31
   ,7,11
PQ 3780 DATA 1,Sb,Antimony,Lead,Palladium
   ,31,31,11
KK 3790 DATA 2,Francium,Fr,Fn,Fc,31,3,15
BL 3800 DATA 3,Indium,26.98,69.72,114.8,2
   6,27,11
HB 3810 DATA 1,Th,Thallium,Thorium,Thuliu
   m,30,11,20
WV 3820 DATA 2,Barium,B,Ba,Bm,30,5,13
KN 3830 DATA 3,Praseodymium,231.0,140.9,9
   5.94,30,13,18
OY 3840 DATA 1,Cd,Tungsten,Cadmium,Luteti
```

continued on next page

```
   |um,30,25,11
IU |3850 DATA 2,Curium,Cu,Cm,Cr,30,23,20
FA |3860 DATA 3,Thulium,168.9,210,258,31,3
   |3,18
MJ |3870 DATA 1,Fr,Fluorine,Iron,Francium,
   |26,3,15
TV |3880 DATA 2,Helium,He,H,Hl,31,37,3
CF |3890 DATA 3,Actinium,88.91,137.3,227,2
   |6,7,15
YV |3900 DATA 1,I,Iridium,Iodine,Titanium,
   |30,35,13
UP |3910 DATA 2,Xenon,X,Xe,Xn,30,37,11
BB |3920 DATA 3,Einsteinium,254,207.2,164.
   |9,31,29,20
FL |3930 DATA 1,P,Phosphorus,Potassium,Pol
   |onium,31,31,7
YV |3940 DATA 2,Nobelium,No,Nb,Nl,31,35,20
JU |3950 DATA 3,Thorium,232.0,260,180.9,31
   |,11,20
AN |3960 DATA 1,Pu,Plutonium,Protactinium,
   |Praseodymium,31,19,20
VZ |3970 DATA 2,Argon,Ag,Ar,An,30,37,7
DU |3980 DATA 3,Ytterbium,79.90,126.9,173.
   |0,26,35,18
IS |3990 DATA 1,Pa,Potassium,Palladium,pro
   |tactinium,26,13,20
WT |4000 DATA 2,Rutherfordium,Ru,Rt,Rf,26
   |9,15
NN |4010 DATA 3,Neodymium,98.91,144.2,186.
   |2,30,15,18
RZ |4020 DATA 1,V,Iridium,Vanadium,Samariu
   |m,30,11,9
US |4030 DATA 2,Californium,Ca,Cf,Cn,30,27
   |,20
BN |4040 DATA 3,Zirconium,47.90,91.22,178.
   |5,30,9,11
FB |4050 DATA 1,Ru,Ruthenium,Rutherfordium
   |,Rhenium,31,17,11
DU |4060 DATA 2,Plutonium,Pu,Pl,Pt,31,19,2
   |0
ZW |4070 DATA 3,Zinc,26.98,65.38,88.91,30,
   |25,9
FN |4080 DATA 1,Lu,Lanthanum,Lead,Lutetium
   |,26,37,18
GX |4090 DATA 2,Samarium,Sm,Sa,Sr,31,19,18
FO |4100 DATA 3,Calcium,9.012,24.31,40.08,
   |26,5,9
DL |4110 DATA 1,Mo,Mendelevium,Manganese,M
   |olybdenum,26,13,11
DP |4120 DATA 2,Iridium,I,Ir,Id,30,19,13
IX |4130 DATA 3,Neon,20.18,39.95,83.80,31,
   |37,5
KB |4140 DATA 1,Gd,Gadolinium,Gallium,Germ
   |anium,31,23,18
QQ |4150 DATA 2,Cerium,Cr,Ce,Cm,30,11,18
OQ |4160 DATA 3,Mercury,200.6,112.4,65.38,
   |31,25,13
```

BASIC PROFILER SPEEDS UP YOUR PROGRAMS

BOTTLENECK BREAKER

Article on page 14

LISTING 1

Don't type the TYPO II Codes!

```
SM |10 REM BASIC PROFILER, PART 1
JH |20 REM BY STAN LACKEY
QH |30 REM (c)1988, ANTIC PUBLISHING
QM |40 X=PEEK(106)-32:REM RESERVE 8K FOR C
   |OUNTERS
UN |50 POKE 106,X:POKE 740,X
IP |60 GRAPHICS 0:? "Working..."
GT |70 FOR X=40704 TO 40827:REM LOAD PROFI
   |LER INTO PAGE 9F
GX |80 READ D:POKE X,D:NEXT X
TW |90 DATA 0,173,0,159,208,2,104,64,152,7
   |2,160,0,177,138,133,203,200,177,138,13
   |3,204,48,95,169,0
HO |100 DATA 133,205,169,80,133,206,169,0,
   |133,207,133,208,160,11,56,165,203,229,
   |205,141,122,159,165,204,229
BZ |110 DATA 206,141,123,159,24,48,11,173,
   |122,159,133,203,173,123,159,133,204,56
   |,38,207,38,208,70,206,102
WN |120 DATA 205,136,16,216,6,207,38,208,2
   |4,165,208,101,106,105,4,133,208,160,0,
   |24,177,207,105,1,145
SJ |130 DATA 207,208,15,200,24,177,207,105
   |,1,145,207,16,5,169,0,141,0,159,104,16
   |8,104,64,0,0
ZV |140 REM SET UP TIMER INTERRUPT
XY |150 POKE 528,1:REM VTIMR1 VECTOR LOW
RC |160 POKE 529,159:REM VTIMR1 HI
JD |170 POKE 53761,0:REM VOLUME TO ZERO
JN |180 POKE 53760,255:REM FREQ OF TMR1
KI |190 POKE 53769,255:REM TURN ON TIMERS
TW |200 POKE 16,193:REM SET TMINT1
QU |210 ? "Done...":? :? "Next:":? :? "LOA
   |D the program to be Profiled":?
ON |220 ? :? "ENTER ";CHR$(34);"D:PROFILE2
   |.LST";CHR$(34):?
SF |230 ? :? "RUN"
```

LISTING 2

```
IZ |1 REM BASIC PROFILER, PART II
   |      (c)1988, ANTIC PUBLISHING
ZF |2 I=(PEEK(106)+4)*256:FOR J=I TO I+655
   |1:POKE J,0:NEXT J:REM CLEAR COUNTERS
JJ |3 POKE 40704,1:REM START PROFILING
YP |31000 POKE 40704,0:REM STOP PROFILING
LH |31010 ? "Done...":? :? "Next:":? :? "R
   |UN ";CHR$(34);"D:PROFILE3.BAS";CHR$(34
   |)
```

LISTING 3

```
US |10 REM BASIC PROFILER, PART 3
JH |20 REM BY STAN LACKEY
QH |30 REM (c)1988, ANTIC PUBLISHING
XI |40 POKE 40704,0:REM STOP PROFILING
AC |100 DIM L(1000),V(1000):REM LINE#, VAL
   |UE
MO |110 I=0:TOTAL=0
ET |115 ? "Reading Counters..."
DY |116 X=(PEEK(106)+4)*256
FA |120 FOR J=0 TO 6550 STEP 2
WS |130 REM READ EACH COUNTER
SE |131 K=PEEK(J+X)+256*PEEK(J+X+1)
XE |140 IF K=0 THEN 170
OS |150 REM SAVE ALL NON-ZERO VALUES
QZ |155 I=I+1
DA |160 L(I)=J*5:V(I)=K:TOTAL=TOTAL+K
GP |170 NEXT J
KS |175 MAX=I
IL |180 ? "TOTAL COUNTS = ";TOTAL
DF |185 ? "IN ";MAX;" PROGRAM LINES"
UT |190 ? "SORTING..."
XM |200 REM ROUTINE SORTS ALL ENTRIES
CR |205 FOR J=1 TO MAX
MK |210 FOR I=J TO MAX
OA |220 IF V(I)<V(J) THEN 260
CR |230 REM EXCHANGE L&V VALUES TO SORT
JH |240 X=V(I):V(I)=V(J):V(J)=X
NB |250 X=L(I):L(I)=L(J):L(J)=X
GE |260 NEXT I
QK |265 ? ".";
GQ |270 NEXT J
NP |380 TRAP 450
BW |390 PF=1
DN |395 ?
NV |400 ? "LINE","COUNTS","PERCENT","CUM P
   |CT"
SJ |410 LPRINT "TOTAL COUNTS = ";TOTAL
XG |420 LPRINT
VN |430 LPRINT "LINE","COUNTS","PERCENT","
   |CUM PCT"
QF |440 GOTO 480
BH |450 PF=0
```

```
RC 480 REM PRINT TOP 20 IF TO SCREEN, OR
DG 485 REM TOP 40 IF PRINTER IS ON
GX 490 J=20+20*PF:IF MAX<J THEN J=MAX
AV 500 CUM=0
AR 510 FOR I=1 TO J
BK 520 PCT=V(I)/TOTAL:CUM=CUM+PCT
OE 530 Y=(INT(0.5+10000*CUM))/100
PP 540 X=(INT(0.5+10000*PCT))/100
PH 550 ? L(I),V(I),X,Y
LB 560 IF PF THEN LPRINT L(I),V(I),X,Y
GJ 570 NEXT I
```

LISTING 4

```
0100 ; BASIC PROFILER SOURCE CODE
0110 ; BY STAN LACKEY
0120 ; (c)1988, ANTIC PUBLISHING INC.
0150 ;
0160 ; Definitions:
0180 TEMP1 = $CB       ; Temps used in
                         routines
0190 TEMP2 = $CD
0200 TEMP3 = $CF
0210 STMCUR = 138      ;  Pointer into
                         user program
0220 RAMTOP = 106
0250 ;
0260      *=  $9F00
0270 ;
0280 PROFEN
0285      .BYTE 0      ; Flag to enable
                         Profiler
0290 ;
0300 ;  SAMPLE is the timer interrupt
0310 ; routine. It takes the current
0320 ; line number, divides it by 10
0330 ; and increments that 16-bit
0340 ; location in the RAM above
0345 ; RAMTOP.
0350 ;
0360 SAMPLE
0365      LDA PROFEN   ; Sense enable
0370      BNE SPL1
0375 ;
0380      PLA          ; It's off...
0390      RTI          ; just return.
0395 ;
0400 SPL1
0401      TYA
0410      PHA          ; Must save Y
0420      LDY #0
0430      LDA (STMCUR),Y ; Get line #
0440      STA TEMP1
0450      INY          ; Point to high
0460      LDA (STMCUR),Y
0470      STA TEMP1+1
0480      BMI EXIT     ; Exit if line
0490 ;                   num is neg.
0500 ; Now, divide line number by 10
0510      LDA # <20480 ; Divisor:
0520      STA TEMP2    ;  #10, Shifted
0530      LDA # >20480
0540      STA TEMP2+1
0550      LDA #0
0560      STA TEMP3    ; Clear quotient
0570      STA TEMP3+1
0580      LDY #11      ; Loop count
0590 DIVLP
0595      SEC
0600      LDA TEMP1
0610      SBC TEMP2
0620      STA TEMP4    ; 16-bit subtr,
0630      LDA TEMP1+1  ; ddnd-dvsr
0640      SBC TEMP2+1
0650      STA TEMP4+1
0660      CLC          ; Init.
0670      BMI NOBIT    ; Shift 0 in
0680 ;                   dvsr > ddnd
0690      LDA TEMP4
0700      STA TEMP1    ; ddnd > dvsr
0710      LDA TEMP4+1  ; Copy new ddnd
0720      STA TEMP1+1
0730      SEC          ; Shift 1 in
0740 NOBIT
0745      ROL TEMP3    ; Shift into
0750      ROL TEMP3+1  ;   quotient
0760      LSR TEMP2+1  ; Shift dvsr
0770      ROR TEMP2
0780      DEY
0790      BPL DIVLP    ; Loop next bit
0795 ;
0800 ; Result is left in TEMP3.
0810 ; Add that result to RAMTOP.
0820      ASL TEMP3    ; 2x result for
0830      ROL TEMP3+1  ; 2-byte access
0840      CLC
0850      LDA TEMP3+1
0860      ADC RAMTOP   ; TEMP3 is now
0870      ADC #4       ; the pointer
0880      STA TEMP3+1  ; into the RAM.
0890      LDY #0
0900      CLC
0910      LDA (TEMP3),Y ; Get cell to
0920      ADC #1       ; increment
0930      STA (TEMP3),Y
0940      BNE EXIT     ; If inc. to 0,
0945 ;
0950      INY
0960      CLC
0970      LDA (TEMP3),Y ; incr high
0980      ADC #1       ;   half
0990      STA (TEMP3),Y
1000      BPL EXIT     ; Test overflow
1005 ;
1010      LDA #0       ; Stop prof
1020      STA PROFEN   ; on overflow
1030 EXIT
1035      PLA
1040      TAY          ; Restore Y
1050      PLA          ;  and A
1060      RTI          ; End of SAMPLE
1065 ;
1070 TEMP4
1075      .WORD 0      ; Temp used in di
vision
```

ESCAPE THOSE KILLER ROBOTS

SHUTDOWN

Article on page 17

LISTING 1

Don't type the TYPO II Codes!

```
RQ 2 REM SHUTDOWN
UK 4 REM BY TONY BARNES
OS 6 REM (c)1988, ANTIC PUBLISHING INC.
PQ 8 REM (DO NOT RENUMBER THIS PROGRAM!)
KS 10 GRAPHICS 18:POKE 559,0:GOSUB 21000:
   GOSUB 20000:POKE 756,152:GOSUB 23000
FP 20 DIM A$(20),X(2),Y(2),D(2)
RX 25 FOR T=0 TO 2:X(T)=0:Y(T)=0:D(T)=1:N
   EXT T
FW 30 GOTO 10000
OG 100 FOR X=10 TO 2 STEP -0.5:POSITION X
   -1,TY:? #6;A$(X,X);:POKE 708,PEEK(20)
UE 110 POSITION 20-X,TY:? #6;A$(21-X,21-X
   ):SOUND 0,42,6,X:SOUND 1,X,0,X
PA 115 NEXT X:SOUND 0,0,0,0:SOUND 1,0,0,0
   :RETURN
GM 120 FOR X=2 TO 10:POSITION X-1,TY:? #6
   ;" )";:POSITION 19-X,TY
IB 130 ? #6;") ";:POKE 708,PEEK(20):SOUND
    0,42,6,X:SOUND 1,X,0,X
PE 135 NEXT X:SOUND 0,0,0,0:SOUND 1,0,0,0
   :RETURN
OB 200 EN=EN+1:IF EN>2 THEN EN=0
LL 205 COLOR 32:PLOT X(EN),Y(EN):X=X(EN)+
   D(EN):LOCATE X,Y(EN),Z
KH 210 IF Z>0 AND Z<8 THEN 2000
```

continued on next page

```
MU 215 IF Z<>32 THEN X=X(EN):D(EN)=-D(EN)
   :COLOR 27:PLOT X,Y(EN):RETURN
FW 220 LOCATE X,Y(EN)+1,Z:IF Z=32 OR Z=47
    THEN X=X(EN):D(EN)=-D(EN):COLOR 27:PL
   OT X,Y(EN):RETURN
OS 225 COLOR 8+2*(D(EN)=-1):X(EN)=X:PLOT
   X(EN),Y(EN):RETURN
MX 1000 ST=PEEK(632):POKE 77,0:GOSUB 200:
   IF PEEK(53279)<>7 THEN 2000
UU 1002 IF ST>11 THEN COLOR 7:PLOT X1,Y1:
   X=X1:GOTO 1020
NN 1005 COLOR 32:PLOT X1,Y1:X=X1+(ST<8)*(
   X1<19)-(ST>8)*(X1>0)
OC 1010 LOCATE X,Y1,Z:IF Z=158 THEN 1050
RJ 1015 IF Z<>32 THEN X=X1
ZJ 1020 LOCATE X,Y1+1,Z:IF Z=32 OR Z=47 T
   HEN 2000
XF 1025 IF Z>170 AND Z<175 THEN 1100
AL 1027 IF ST>12 THEN 1000
PV 1030 WL=WL+1:IF WL>3 THEN WL=0
KO 1035 X1=X:SOUND 3,100,8,6:IF ST<8 THEN
    COLOR 1+WL-2*(WL=3):PLOT X1,Y1
ZH 1040 IF ST>8 THEN COLOR 4+WL-2*(WL=3):
   PLOT X1,Y1
RL 1045 SOUND 3,0,0,0:GOTO 1000
RA 1050 FOR T=15 TO 0 STEP -3:SOUND 0,50,
   10,T:SOUND 1,T+INT(RND(0)*10),10,T
LN 1055 NEXT T:COLOR 159:PLOT X,Y1:SC=SC+
   5:POSITION 5,11:? #6;SC
TF 1060 MAX=MAX-1:POKE 708,112+(MAX*2):IF
    MAX<0 THEN 2100
OA 1065 GOTO 1000
EQ 1100 X1=X:SOUND 0,47,2,4:SOUND 1,162,1
   0,4:IF Z<>173 THEN 1150
SN 1105 LOCATE X1,Y1-1,Z:IF Z=47 THEN 112
   0
XT 1110 COLOR 32:PLOT X1,Y1+1:Y1=Y1-1:COL
   OR 7:PLOT X1,Y1:COLOR 173
DD 1115 PLOT X1,Y1+1:GOSUB 200:GOTO 1105
SV 1120 Y1=Y1-1:COLOR 32:PLOT X1,Y1+1:PLO
   T X1,Y1+2:Y1=Y1-1:COLOR 7
YW 1125 PLOT X1,Y1:COLOR 186:PLOT X1,Y1+1
   :FOR T=4 TO 0 STEP -0.3
SN 1130 SOUND 0,47,2,T:SOUND 1,162,10,T:N
   EXT T:X=X1:GOTO 1000
US 1150 IF Z<>174 THEN 1200
ZT 1155 LOCATE X1,Y1+2,Z:IF Z=47 THEN 117
   0
LK 1160 COLOR 32:PLOT X1,Y1:Y1=Y1+1:COLOR
    7:PLOT X1,Y1:COLOR 174
KQ 1165 PLOT X1,Y1+1:GOSUB 200:GOTO 1155
SN 1170 COLOR 32:PLOT X1,Y1:Y1=Y1+1:COLOR
    7:PLOT X1,Y1:COLOR 186
XS 1175 PLOT X1,Y1+1:FOR T=4 TO 0 STEP -0
   .3:SOUND 0,47,2,T:SOUND 1,162,10,T
AX 1180 NEXT T:X=X1:GOTO 1000
XA 1200 IF Z<>171 THEN 1250
FH 1205 LOCATE X1-1,Y1+1,Z:IF Z=47 THEN 1
   220
TS 1210 COLOR 32:PLOT X1,Y1:PLOT X1,Y1+1:
   X1=X1-1:COLOR 7:PLOT X1,Y1:COLOR 171
EO 1215 PLOT X1,Y1+1:GOSUB 200:GOTO 1205
KW 1220 COLOR 32:PLOT X1,Y1:PLOT X1,Y1+1:
   X1=X1-1:COLOR 7:PLOT X1,Y1:COLOR 186
XF 1225 PLOT X1,Y1+1:FOR T=4 TO 0 STEP -0
   .3:SOUND 0,47,2,T:SOUND 1,162,10,T
AK 1230 NEXT T:X=X1:GOTO 1000
LQ 1250 LOCATE X1+1,Y1+1,Z:IF Z=47 THEN 1
   270
UK 1255 COLOR 32:PLOT X1,Y1:PLOT X1,Y1+1:
   X1=X1+1:COLOR 7:PLOT X1,Y1:COLOR 172
EE 1260 PLOT X1,Y1+1:GOSUB 200:GOTO 1250
IB 1270 COLOR 32:PLOT X1,Y1:PLOT X1,Y1+1:
   X1=X1+1:COLOR 7:PLOT X1,Y1:COLOR 186
XU 1275 PLOT X1,Y1+1:FOR T=4 TO 0 STEP -0
   .3:SOUND 0,47,2,T:SOUND 1,162,10,T
AZ 1280 NEXT T:X=X1:GOTO 1000
YC 2000 COLOR 32:PLOT X1,Y1:X1=X
WC 2005 POSITION 0,11:? #6;" INTRUDER DES
   TROYED ";:FOR T=100 TO 255 STEP 5
OO 2010 SOUND 0,T,10,5:SOUND 1,T,12,5:POK
   E 709,PEEK(20)
LK 2015 COLOR 7+2*(T/3=INT(T/3)):PLOT X1,
   Y1:NEXT T
EI 2020 FOR I=0 TO 3:SOUND I,0,0,0:NEXT I
   :MN=MN-1:IF MN>0 THEN 4000
KZ 2025 FOR T=0 TO 255 STEP 5:SOUND 0,T,1
   0,T/25:SOUND 1,T+1,10,T/25
VX 2030 FOR I=708 TO 711:POKE I,T:NEXT I:
   NEXT T
BU 2035 COLOR 91:FOR T=0 TO 250 STEP 10:S
   OUND 1,T,2,4:SOUND 0,T,0,4
GS 2040 PLOT 0,T/25:DRAWTO 19,T/25:NEXT T
   :SOUND 0,0,0,0:SOUND 1,0,0,0:GOTO 1000
   0
GN 2100 FOR T=0 TO 15:SOUND 0,T,8,2:FOR I
   =708 TO 711:POKE I,T:NEXT I:NEXT T
LN 2105 RESTORE 2150+20*(RND(0)*2>1)
PI 2110 READ P1,P2,DR:SOUND 1,P1,10,10:SO
   UND 2,P2,10,10
BY 2115 FOR T=0 TO DR*5:NEXT T:IF P2<>193
    THEN 2110
FB 2125 FOR T=15 TO 0 STEP -1:SOUND 0,T,8
   ,T:FOR I=708 TO 711:POKE I,T:NEXT I
OH 2130 NEXT T:SC=SC+10*SCR:SCR=SCR+1:IF
   (SCR=4 AND LVL=0) OR SCR=8 THEN 3000
RV 2135 SOUND 1,0,0,0:SOUND 2,0,0,0:GOTO
   4000
NB 2150 DATA 64,162,4,96,162,4,64,162,4,9
   6,162,4
QH 2155 DATA 81,162,4,108,162,4,81,162,4,
   108,162,4
RB 2160 DATA 136,182,16,144,182,32,144,19
   3,32
JI 2170 DATA 47,64,4,0,0,2,64,81,4,0,0,2,
   81,96,4,96,153,16,108,144,4
BX 2175 DATA 0,0,2,108,144,4,144,193,16
WV 3000 POSITION 0,11:? #6;"  MISSION COM
   PLETE ";:POKE 708,114:POKE 710,52
QU 3005 SOUND 2,0,0,0:FOR T=10 TO 2 STEP
   -1:COLOR 219:PLOT 0,T:DRAWTO 19,T
TO 3010 SOUND 0,200,2,10-T:SOUND 1,100,8,
   10-T:NEXT T
HV 3015 FOR T=0 TO 10:COLOR 32:PLOT 19,T:
   DRAWTO 16-3*(T<2),T:PLOT 13,T
PV 3020 DRAWTO 11*(T>5),T:PLOT 8,T:DRAWTO
    0,T:SOUND 0,200,2,10-T
BA 3025 SOUND 1,PEEK(53770),8,10-T:NEXT T
   :COLOR 64:PLOT 0,10:DRAWTO 19,10
BN 3030 SOUND 0,0,0,0:SOUND 1,0,0,0:POKE
   711,6:A=PEEK(560):B=0
OR 3035 FOR T=5 TO 8:FOR I=0 TO 20:SOUND
   0,PEEK(53770),8,5:POKE 560,A+RND(0)*1
SR 3040 B= NOT B:COLOR 252+2*B:PLOT 8,9:P
   LOT 11,9:COLOR 253+2*B
KU 3045 PLOT 9,9:PLOT 10,9:NEXT I:COLOR 3
   2:PLOT 9,T:PLOT 10,T:NEXT T
MN 3050 IF LVL=0 THEN LVL=1:GOTO 3080
TW 3055 FOR T=2 TO 8:FOR I=0 TO 20:SOUND
   0,PEEK(53770),8,8:POKE 560,A+RND(0)*1
ID 3060 B= NOT B:COLOR 252+2*B:PLOT 8,9:P
   LOT 11,9:PLOT 13,9:PLOT 16,9
KY 3065 COLOR 253+2*B:PLOT 9,9:PLOT 10,9:
   PLOT 14,9:PLOT 15,9:NEXT I
XZ 3070 COLOR 32:PLOT 14,T:PLOT 15,T:NEXT
    T
QQ 3080 POKE 560,A:FOR T=8 TO 0 STEP -0.5
   :SOUND 0,PEEK(53770),8,T:NEXT T
YY 3085 SC=SC+100:COLOR 32:PLOT 0,9:DRAWT
   O 19,9:IF SCR<8 THEN 4000
QB 3100 TY=0:A$="    well done      ":GO
   SUB 100:POKE 709,14:POKE 710,50
US 3105 FOR T=100 TO 255:SOUND 0,T,10,T/2
   5:SOUND 1,T,2,T/25:NEXT T
KC 3110 SOUND 0,0,0,0:SOUND 1,0,0,0:LVL=0
   :SC=SC+100:SCR=1:MN=MN+1:GOTO 4000
WE 4000 POKE 712,148:POSITION 0,0:? #6;"▪
   ":POSITION 5,5:? #6;"GET READY"
FR 4005 POKE 708,14:FOR T=0 TO 200:NEXT T
AQ 4010 POKE 559,0:POKE 712,0:POKE 710,40
   :POKE 709,172:POKE 711,10:POKE 708,0
ZX 4015 POSITION 0,11:? #6;"score";SC:POS
   ITION 10,11:? #6;"men ";MN
WQ 4020 POSITION 0,1:ON SCR GOSUB 4100,41
   60,4220,4280,4340,4400,4460
JV 4025 POKE 559,34:FOR T=112 TO 112+(MAX
   *2) STEP 0.1:POKE 708,T:NEXT T
OG 4030 FOR T=50 TO 100:SOUND 0,T,10,5:SO
   UND 1,T+2,10,5:NEXT T
QW 4035 SOUND 0,0,0,0:SOUND 1,0,0,0:X=X1:
   GOTO 1000
GI 4099 REM ( "▪" IS [ESC][CTRL][TAB] )
CB 4100 ? #6;"        ▪ ▪         ";
SJ 4105 ? #6;"e e▪eeee/e e/eeee▪  ";
AW 4110 ? #6;"                   ▪";
KX 4115 ? #6;"e▪e/   ▪/      ▪/eee";
CT 4120 ? #6;"              ▪     ";
KD 4125 ? #6;"      / eee▪e/e     ";
GW 4130 ? #6;"                    ";
EJ 4135 ? #6;"  eeeee      ▪eeee/ ";
WX 4140 ? #6;"▪   ▪ e▪            ";
EG 4145 ? #6;"e/eeeeeeeeeeeeeeee▪e";
HK 4150 MAX=6:X1=9:Y1=9:FOR T=0 TO 2:D(T)
   =1:X(T)=3:Y(T)=7:NEXT T
BN 4155 RETURN
SD 4160 ? #6;"                  e ";
```

```
EJ 4165 ? #6;"e■eeeeeeeeeeee/eeee■";
CW 4170 ? #6;"■                    ■ ";
KP 4175 ? #6;"e/■/              ■/ee ";
IB 4180 ? #6;"      eeeee             ";
FE 4185 ? #6;"        /    /■   /■ee ";
NE 4190 ? #6;"      /■      /■   ■ ";
ID 4195 ? #6;"■       /   ■/■     ■/e ";
GJ 4200 ? #6;"e■                      ";
HJ 4205 ? #6;"ee/■eeeee■eeeeee/■e/";
QQ 4210 MAX=3:X1=19:Y1=1:X(0)=17:Y(0)=1:X
(1)=5:Y(1)=9:X(2)=7:Y(2)=4
BD 4215 RETURN
YB 4220 ? #6;"eeeeeeeeee/■    /■ee";
PF 4225 ? #6;"      ■          e■  ";
AZ 4230 ? #6;"eeee/eeeee■eeeeee/ee";
HA 4235 ? #6;"e                   ■ ";
NB 4240 ? #6;"eeee■eeeeeeeeeeeee/eee";
IB 4245 ? #6;"              ■       e";
TK 4250 ? #6;"/eeeee■e/eeeee■e■e/e";
XU 4255 ? #6;" e    ■    e            ";
SR 4260 ? #6;" e    ■    e    ■       ";
OL 4265 ? #6;"■eeeee/e■eeeee/eee■e";
FR 4270 MAX=5:X1=0:Y1=9:X(0)=10:Y(0)=6:X(
1)=4:Y(1)=4:X(2)=12:Y(2)=2
BV 4275 RETURN
DN 4280 ? #6;"e                 eeeeeee";
XE 4285 ? #6;"eeeeee/■ /■    ■     ";
XM 4290 ? #6;"e                e/e■e";
IS 4295 ? #6;"e■e/          ■/     ";
AL 4300 ? #6;"■    / ■/■e■/■      ■";
YK 4305 ? #6;"e/e■e              ■/e";
GI 4310 ? #6;"      ■                 ";
XW 4315 ? #6;"e■e/e              /e■";
PO 4320 ? #6;"■             /■   /■■ ";
NC 4325 ? #6;"e/eeeee■eee /e■   ee/";
IX 4330 MAX=5:X1=9:Y1=4:X(0)=3:Y(0)=1:X(1
)=4:Y(1)=1:X(2)=7:Y(2)=9
BL 4335 RETURN
UR 4340 ? #6;"■                       ";
FG 4345 ? #6;" ■/                  ■/";
VP 4350 ? #6;"       ■eee  eeee   /  ";
FO 4355 ? #6;"           eeee  eee    ";
MP 4360 ? #6;"     ■             ■    ";
US 4365 ? #6;"  eee/eeeeeeeeeeee      ";
HM 4370 ? #6;"                        ";
EO 4375 ? #6;" /■               /■   ";
HP 4380 ? #6;"                        ";
KS 4385 ? #6;"/■                 /■  ";
YH 4390 MAX=1:X1=0:Y1=0:X(0)=16:Y(0)=3:X(
1)=3:Y(1)=5:X(2)=10:Y(2)=3
CD 4395 RETURN
ZH 4400 ? #6;"      ■ e    ■      ■ ";
KZ 4405 ? #6;"■ee/eeee■e/eee■ee/ee";
EQ 4410 ? #6;"            ■           ";
TN 4415 ? #6;"/ee■ee■e/e■e/ /e■■e/";
ET 4420 ? #6;"            ■           ";
XE 4425 ? #6;"■eeee//e■e/e■ ■e//e■";
YG 4430 ? #6;"                ■       ";
QI 4435 ? #6;" ee/e■■e/ ■e/e/e■■e/";
XN 4440 ? #6;" ■e    ■                ";
DB 4445 ? #6;"/ee■ee/eeeee■eee/ e■";
HF 4450 MAX=7:X1=19:Y1=9:X(0)=14:Y(0)=1:X
(1)=14:Y(1)=9:X(2)=3:Y(2)=3
BT 4455 RETURN
GN 4460 ? #6;"/eeeeeeeee■eeeeee ■ ";
DE 4465 ? #6;"                    eee/";
GL 4470 ? #6;"■/■ /     ■/■  /■     ";
EF 4475 ? #6;"               /■   /■";
WA 4480 ? #6;"    ■/   ■/■   ■      ";
YA 4485 ? #6;"                  e/  ■e";
ST 4490 ? #6;"    /■/       /■eeeee e";
IO 4495 ? #6;"                        ";
PV 4500 ? #6;"e                    ■";
GJ 4505 ? #6;"e■eeeeeee■ee■eeeee/e";
WS 4510 MAX=2:X1=5:Y1=9:X(0)=17:Y(0)=9:X(
1)=11:Y(1)=0:X(2)=16:Y(2)=6
BJ 4515 RETURN
ZB 10000 POSITION 0,0:? #6;"■":POKE 559,0
:COLOR 8:PLOT 0,2:PLOT 0,4:PLOT 0,7
EL 10005 PLOT 0,11:COLOR 10:PLOT 19,2:PLO
T 19,4:PLOT 19,7:PLOT 19,11
VE 10010 POKE 709,4:POKE 710,12:POKE 711,
50:POKE 559,34
ZB 10020 A$=")))ANTIC)PRESENTS)))":TY=2:G
OSUB 100
EC 10025 A$=")))))shut))down)))))":TY=4:G
OSUB 100
WV 10030 A$=")))BY)TONY)BARNES)))":TY=7:G
OSUB 100
ES 10035 IF PEEK(644)=0 OR PEEK(53279)=5
THEN 10100
LI 10040 TY=11:A$=")PRESS)fire)TO)PLAY)":
GOSUB 100:POKE 540,50
XW 10045 POKE 708,PEEK(20):IF PEEK(644)=0
THEN 10100
OF 10050 IF PEEK(540)>0 THEN 10045
LT 10055 A$="■FINAL■SCORE■":A$(14)=STR$(S
C):A$(LEN(A$)+1)="■■■■■■":GOSUB 100:PO
KE 540,50
XF 10060 POKE 708,PEEK(20):IF PEEK(644)=0
THEN 10100
LR 10065 IF PEEK(540)>0 THEN 10060
TX 10070 GOSUB 120:GOTO 10040
PP 10100 TY=11:GOSUB 120:TY=7:GOSUB 120:T
Y=4:GOSUB 120:TY=2:GOSUB 120
YY 10105 FOR T=8 TO 0 STEP -1:FOR I=708 T
O 711:POKE I,T:NEXT I:NEXT T
NY 10110 SC=0:SCR=1:MN=3:LVL=0:GOTO 4000
QC 20000 POKE 559,0:RESTORE 21100:READ DN
UM
BS 20010 D=PEEK(560)+256*PEEK(561)+4
GQ 20020 FOR I=1 TO DNUM:READ B:POKE D+B,
135:NEXT I
AX 20030 B=INT(ADR(DLI$)/256):A=ADR(DLI$)
-B*256:POKE 512,A:POKE 513,B
UW 20040 POKE 54286,192:POKE 256,Z:POKE 5
59,34:RETURN
RJ 21000 DIM DLI$(67)
YW 21010 DLI$="H■■H■■■■■■■■■H■■■■■■he■■
■■■1■■■■■he■■"
RD 21012 DLI$(41)="■■■■■■■■■■■he■■■■■■■■■
■■he"
FJ 21095 RETURN
IB 21100 DATA 4,4,6,8,10
NK 23000 DIM RDC$(200),MOV$(46)
YT 23005 POKE 559,0:CHR=38912:I=256*224
WT 23010 DIM CH$(20):CH$="h■■■■■■■■■■■■■
■■■■":GOSUB 30100
QN 23012 MOV$="hh■■h■■h■■h■■h■■h■■■■■■■
■■■■■■■■■■■■■■■■":MOVE=ADR(MOV$)
MI 23015 POKE 204,152:POKE 206,224:I=USR(
ADR(CH$)):POKE 559,34
JS 23020 I=USR(MOVE,ADR(RDC$),CHR+8,120):
I=USR(MOVE,ADR(RDC$)+120,CHR+208,16)
CU 23030 I=USR(MOVE,ADR(RDC$)+136,CHR+240
,24):I=USR(MOVE,ADR(RDC$)+160,CHR+472,
40)
DU 23040 RETURN
GZ 30100 RDC$(1,60)="■■■8Z■$B■■■■■■0■■■■
Z■$B00■8Z■$B00■8■■■■00■■Z■$B■■<Z<■■$B■■
&■"
EZ 30110 RDC$(61,120)="■■■■■■■w*■■■■■d■■■
>U■■aC■■■■■■aC■■■■■■aC■■■■■■aC■■■■■■■■
■■■■"
RM 30120 RDC$(69,69)=CHR$(34)
GM 30130 RDC$(121,160)="■■aC■■■■■$B$<■■f<
■■■fB f■■■<■fB f■■■■CB$■■■"
PC 30140 RDC$(161,200)="■■■■■■■■■■■e■■■U85
0T7■■■J0■■■P■;o■■■+1■■5■":RETURN
```

LISTING 2

```
VS 10 REM SHUTDOWN, LISTING 2
VK 20 REM BY TONY BARNES
GD 30 REM (c) 1985,1988 ANTIC PUBLISHING
YT 35 REM (CREATES LINES 21010-21012, 230
10-23012 & 30100-30140)
EV 40 REM (LINES 10-250 MAY BE USED WITH
OTHER BASIC LOADERS IN THIS ISSUE.
IJ 50 REM CHANGE LINE 70 AS NECESSARY.)
PR 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
EEK(10592):POKE 10592,255
ST 70 FN$="D1:LINES.LST":REM THIS IS THE
NAME OF THE DISK FILE TO BE CREATED
RD 80 ? "■Disk or ■assette?";:POKE 764,25
5
PY 90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
58) THEN 90
TH 100 IF PEEK(764)=18 THEN FN$="C:"
VB 110 POKE 764,255:GRAPHICS 0:? "     AN
TIC'S GENERIC BASIC LOADER"
MY 120 ? ,"BY CHARLES JACKSON"
KB 130 POKE 10592,DPL:TRAP 200
PU 140 ? :? :? "Creating ";FN$:? "...plea
se stand by."
LW 150 RESTORE :READ LN:LM=LN:DIM A$(LN):
C=1
BQ 160 AR$="":READ AR$
YC 170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
2,255
DM 180 LM=LM-1:POSITION 10,10:? "(Countdo
wn...T-";INT(LM/10);")     "
BK 190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
```

continued on next page

```
   1:NEXT X:GOTO 160
MM 200 IF PEEK(195)=5 THEN ? :? :? "⌧TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CM 210 IF C<LN+1 THEN ? :? "⌧TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
UQ 220 IF FN$="C:" THEN ? :? " Prepare ca
   ssette, press [RETURN]"
AR 230 OPEN #1,8,0,FN$
PV 240 POKE 766,1:? #1;A$;:POKE 766,0
AL 250 CLOSE #1:GRAPHICS 0:? " COMPLETED 
   "
JN 1000 DATA 527
LU 1010 DATA 050049048049048032068076073
   036061034072173000001238000001141010212
   2010002080101690721410224208
OS 1020 DATA 14101021210406420100120801 01
   6910814102420814101021210406420100 2034
   155050049048049050032068076
GO 1030 DATA 073036040052049041061034208 0
   101691361410242081410102121040641690 00
   141000001169168141024208141
ZO 1040 DATA 010212104064034155050051048 0
   490480320680730770320670720360400500 48
   041058067072036061034104162
PL 1050 DATA 004160000177205145203200208 2
   492302062302042022082420960340580710 79
   083085066032051048049048048
ZP 1060 DATA 155050051048049050032077079 0
   860360610341041041332411041332401041 33
   213104133212104133239104133
SI 1070 DATA 23816000017724014521223021 22
   080022302132302402080022302411982382 08
   234198239016230096034058077
ZA 1080 DATA 079086069061065068082040077 0
   790860360411550510480490480480320820 68
   067036040049044054048041061
BG 1090 DATA 034012012024056090024036066 0
   120120240280240240480160120120240280 90
   024036066048048024056090024
BY 1100 DATA 036066048048024056024024012 0
   080480480240280900240360660240240600 90
   060024036066003006038126034
VU 1110 DATA 155051048049049048032082068 0
   670360400540490440490500480410610342 51
   248124170000136221119042000
BD 1120 DATA 000000192096100126223031062 0
   850002552251951352550000000002552251 95
   135255000000000255225195135
XT 1130 DATA 255000000000255225195135255 0
   000000000000000000000000000000341550 51
   048049051048032082068067036
DF 1140 DATA 040049050049044049054048041 0
   610340002552251951352550000000240360 66
   036060126255102060024024126
XU 1150 DATA 102066102126000000060126102 0
   661021260002551290660360242550000341 55
   051048049052048032082068067
MR 1160 DATA 036040049054049044050048048 0
   410610342551531532552551531532550010 00
   064010000220246184181079212
ZT 1170 DATA 055215235202239128000002080 0
   000591110291732420432362352150832470 34
   058082069084085082078032155
```

ANTIC'S ANNUAL 1040 SYNCALC TEMPLATE

1988 TAX SPREADSHEET

Article on page 22

LISTING 1

```
A4 1
A5 2
A6 3
A7 4
A8 5
A11 6
A13 7
A14 8
A15 8a
A16 9
A17 10
A18 11
A19 12
A20 13
A21 14
A22 15
A23  16a
A24 17a
A25 18
A26 19
A27 20
A28 21a
A29     b
A30 22
A31 23
A32 -
A33 24
A34 25a
A35 25b
A36 26
A37 27
A38 28
A39 29
A40 30
A41 -
A42 31
A43 =
A44 32
A45 33a
A46 34
A47 35
A48 36
A49 37
A50 38
A51 39
A52 40
A53 -
A54 41
A55 42
A56 43
A57 44
A58 45
A59 46
A60 47
A61 -
A62 48
A63 49
A64 50
A65 51
A66 52
A67 53
A68 -
A69 54
A70 55
A71 56
A72 57
A73 58
A74 59
A75 60
A76 61
A77 -
A78 62
A79 63
A80 64
A81 65
A82 =
A85 1a
A86 b
A90 2
A91 3
A92 4
A93 -
A94 5
A95 6
A96 7
A98 8
A99 -
A100 NOTE: NEW RULES APPLY TO HOME MORTGAGE
A101 INTEREST DEDUCTION.  SEE BOOKLET.
A102 9a
A103 b
```

```
A104 10
A105 11
A106 12a
A107 b
A108 13
A109 -
A110 14
A111 15
A112 16
A113 17
A114 -
A115 18
A116 -
A117 19
A118 -
A119 20
A120 21
A121 22
A122 23
A123 24
A124 -
A125 25
A126 -
A127 26
A128 =
A130 1
A131 2
A137 3
A139 4
A145 6
A146 7
A147 8
A148 9
A149 =
A151 PART I
A152
A153 1
A154 2
A155 3
A156 4
A157 5
A158 6
A159 -
A160 7
A161 8
A162 9
A163
A164 -
A165 10
A166 11
A167 12
A168 13
A169 -
A170 14
A171 15
A172 16
A173 17
A174 -
A175 PART II
A176 1
A177 2
A178 3
A179 4
A180 5
A181 6
A182 7
A183 8
A184 9
A185 10
A186 11
A187 12
A188 13
A189 14
A190 15
A191 Section C - Actual Expenses
A192 16
A193 17
A194 18
A195 19
A196 20
A197 21
A198 22
A199 Section D - Depreciation of Vehicles.
A201 V 1
A202 V 2
A203 =
B2 1988 Income Tax Spreadsheet:  Form 1040
B3 Filing Status
B4 Single
B5 MARRIED FILING JOINT.
B6 MARRIED FILING SEPARATE RETURN.
B7 HEAD OF HOUSEHOLD.
B8 QUALIFYING WIDOW(er) w/dependent child
B9          Enter filing status number here
B11 Enter total number of exemptions.
B13 Wages, salaries, tips, etc.
B14 TAXABLE interest income (attach Sched B if > $400)
B15 Tax-exempt interest income.
B16 Dividend income. (attach Sched B if > $400)
B17 Taxable refunds of state and local income taxes.
B18 Alimony received.
B19 Business income (loss)(attach Sched C)
B20 Capital gain (loss)(attach Sched D)
B21 Capitalgain distributions not on line 13
B22 Other gains (losses)
B23 Total IRA distributions
B24 Total Pensions & annuities
B25 Rents, royalties, etc (attach Sched E)
B26 Farm income (attach Sched F)
B27 Unemployment compensation.
B28 Social security benefits
B29 Taxable amount, if any
B30 Other income
B31 TOTAL INCOME (Add lines 7 through 22).
B32 ------------------------------------
B33 Reimbursed employee business expense.
B34 Your IRA deduction
B35 Spouse's IRA deduction
B36 Self-employed health insurance deduction
B37 Keogh retirement & SEP deduction
B38 Penalty on early withdrawal of savings
B39 Alimony paid
B40 Add lines 24 - 29.  TOTAL ADJUSTMENTS.
B41 ------------------------------------
B42 Subtract line 30 from 23.  ADJUSTED GROSS INCOME.
B43 ====================================
B44 Amt from line 30 (adjusted gross income)
B45 Add # of boxes checked and enter here
B46 ITEMIZED DEDUCTIONS
B47 Subtract 34 from 32.
B48 Multiply $1950 by the number of exemptions.
B49 TAXABLE INCOME.  Subtract line 36 from 35.
B50 Enter tax from table, rate sched, or Form 8615 etc.
B51 Additional taxes from Form 4970 or Form 4972.
B52 Add lines 38 and 39.
B53 ------------------------------------
B54 Credit for Child Care Expenses.
B55 Credit for elderly/disabled.
B56 Foreign tax credit.
B57 General business credit
B58 Credit for prior year minimum tax
B59 Add lines 41 through 45
B60 Subtract line 46 from 40.
B61 ------------------------------------
B62 Self Employment Tax (Sched SE).
B63 Alternative minimum tax.
B64 Recapture taxes
B65 Social security tax on tips.
B66 Tax on an IRA or qualified retirement plan
B67 Add lines 47 through 52.  This is TOTAL TAX.
B68 ------------------------------------
B69 Federal income tax withheld.
B70 1988 estimated tax pmts.
B71 Earned income credit.
B72 Amt paid with Form 4868.
B73 Excess social security tax.
B74 Credit from Federal tax on fuels.
B75 Regulated investment company credit.
B76 Add lines 54 through 60.  TOTAL PAYMENTS.
B77 ------------------------------------
B78 If line 61 > line 53 enter amount OVERPAID.
B79 Amount of line 62 to be REFUNDED TO YOU.
B80 Amt of line 62 to be applied toward '89.
B81 If line 53 > line 61 enter AMOUNT YOU OWE.
B82 ====================================
B84 SCHEDULE A
B85 Drugs, doctors, dentists care expenses
B86 Other (hearing aids, dentures, etc)
B87 ____________________________________
B88 ____________________________________
B89 ____________________________________
B90 Add lines 1a and 1b.
B91 Multiply 1040 line 32 by 7.5%
B92 Subtract line 3 from line 2.
B93 ------------------------------------
B94 State and local income taxes
B95 Real estate taxes
B96 Other taxes (include personal property tax)
B97 ------------------------------------
B98 Add lines 5 through 7.  Enter total here.
B99 ------------------------------------
B100 NEW RULES APPLY TO HOME MORTGAGE
B101 ST DEDUCTION.  SEE BOOKLET.
B102 Home mortage int. pd to financial inst.
B103 Home mortage int. pd to individuals.
B104 Deductible points
B105 Deductible investment interest
B106 Personal interest you paid.
```

continued on next page

```
B107 Multiply 12a by 40%
B108 Add lines 9a through 11 and 12b.
B109 ------------------------------------
B110 Contributions by cash or check.
B111 Other than cash or check.
B112 Carryover from prior year.
B113 Add amounts on lines 14 through 16.
B114 ------------------------------------
B115 Casualty or theft loss(es).
B116 ------------------------------------
B117 Moving expenses.
B118 ------------------------------------
B119 Unreimbursed employee business expenses.
B120 Other expenses__________________________
B121 Add the amounts on lines 20 and 21.
B122 Multiply 1040 line 32 by 2%.
B123 Subtract line 23 from line 22.
B124 ------------------------------------
B125 Other_____________________________________
B126 ------------------------------------
B127 Add lines 4,8,13,17,18,19,24, and 25.
B128 ====================================
B129 SCHEDULE B
B130 Interest income from seller-financed mortgages.
B131 Other interest income:____________________
B132 ____________________________________
B133 ____________________________________
B134 ____________________________________
B135 ____________________________________
B136 ____________________________________
B137 Add amounts on lines 1 and 2.
B138 ------------------------------------
B139 Dividend income:______________________________
B140 ____________________________________
B141 ____________________________________
B142 ____________________________________
B143 ____________________________________
B144 ____________________________________
B145 Capital gain distributions.
B146 Nontaxable distributions
B147 Add lines 6 and 7.
B148 Subtract line 8 from line 5.
B149 ====================================
B150 FORM 2106: EMPLOYEE BUSINESS EXPENSES
B153 Vehicle Exp. from Part 2 line 15 or 22
B154 Parking fees, tolls, bus, train, etc.
B155 Travel exp. while away from home.
B156 Bus. exp. not in line 1 through 3.
B157 Meals and entertainment.
B158 Add lines 1 through 5.
B159 ------------------------------------
B160 Unreported reimbursements for expenses.
B161 Subtract line 6 from line 7.
B162 Add both amounts on line 8.
B163 (YOU MUST MANUALLY ADD line 9 TO AMOUNT on 1040 line 7).
B164 ------------------------------------
B165 Subtract line 7 from line 6.
B166 Reported reimbursements for expenses.
B167 Enter the smaller of line 10 or 11.
B168 Add both amounts on line 12.
B169 ------------------------------------
B170 Subtract line 12 from line 10.
B171 Enter 20% of line 14 Column B.
B172 Subtract line 15 from line 14.
B173 Add both amounts on line 16.
B174 ------------------------------------
B175 I
B176 Date vehicle was placed in service.
B177 Total mileage during 1988.
B178 Miles on line 2 for business.
B179 Percent of business use.
B180 Avg daily round trip commute distance.
B181 Miles on line 2 for commuting.
B182 Other personal mileage.
B183 Have another vehicle for personal use ?
B184 Is personal use allowed on company vehicle ?
B185 Do you have evidence to support deduction ?  Is it written ?
B186 Enter smaller of line 3 or 15,000 miles.
B187 Subtract line 11 from line 3.
B188 Multiply line 11 by 24 cents.
B189 Multiply line 12 by 11 cents.
B190 Add lines 13 and 14.
B191 n C - Actual Expenses
B192 Gas, oil, repairs, insurance, etc.
B193 Vehicle rentals.
B194 Value of employer-provided vehicle.
B195 Add lines 16 through 18.
B196 Multiply line 19 by % on line 4.
B197 Depreciation from Section D, col. F.
B198 Add lines 20 and 21.
B199 n D - Depreciation of Vehicles.
B200 (d) Depreciation Deduction
B203 ====================================
C4 3000
C5 5000
C6 2500
C7 4400
C8 5000
C9  here
C10 0
C23 0
C24 0
C28 0
C32 ---------------
C83 0
C34 0
C35 0
C36 0
C37 0
C38 0
C39 0
C41 ---------------
C43 ===============
C45 0
C53 ---------------
C54 0
C55 0
C56 0
C57 0
C58 0
C61 ---------------
C68 ---------------
C69 0
C70 0
C71 0
C72 0
C73 0
C74 0
C75 0
C77 ---------------
C80 0
C82 ===============
C85 0
C89 0
C90 @SUM(C85:C89)
C91 0.075*D44
C93 ---------------
C94 0
C95 0
C97 0
C99 ---------------
C102 0
C103 0
C104 0
C105 0
C106 0
C107 0
C109 ---------------
C110 0
C111 0
C112 0
C114 ---------------
C116 ---------------
C118 ---------------
C119 0
C120 0
C121 @SUM(C119:C119)
C122 C120*0.02
C124 ---------------
C125 _______________
C126 ---------------
C128 ===============
C131 _______________
C132 _______________
C133 _______________
C134 _______________
C135 _______________
C136 _______________
C138 ---------------
C139 _______________
C140 _______________
C141 _______________
C142 _______________
C143 _______________
C144 _______________
C145 0
C146 0
C149 ===============
C151 COLUMN A
C152 Non-Entrnmt
C153 0
C154 0
C155 0
C156 0
C157 ///////////////
C158 @SUM(C153:C157)
C159 ---------------
C160 0
C161 C158-C160
C162 ///////////////
C163
C164 ---------------
C165 C158-C160
C166 0
C167 @MIN(C166:C165)
C168 ///////////////
C169 ---------------
C170 C165-C167
C171 ///////////////
C172 C170
C173 ///////////////
C174 ---------------
C175 VEHICLE I
C176 ___/___/___
C177 0
C178 0
C179 (C178/C177)*100
C180 0
C181 0
C182 0
C183
C184
C185
C186 0
C187 C178-C186
C188 C186*0.24
C189 C187*0.11
C190 @SUM(C188:C189)
C191 Vehicle 1
C192 0
C193 0
C194 0
C195 @SUM(C194:C192)
C196 (C195*C179)/100
C197 0
C198 @SUM(C196:C197)
C199
C200 (e) Sec 179
C201 0
C202 0
C203 ===============
```

```
D9 1
D10 0
D11 0
D13 0
D14 0
D15 0
D16 0
D17 0
D18 0
D19 0
D20 0
D21 0
D22 0
D23 0
D24 0
D25 0
D26 0
D27 0
D29 0
D30 0
D31 @SUM(D30:D31)
D32 -------------------------
D40 @SUM(C39:C33)
D41 -------------------------
D42 D31-D40
D43 =========================
D44 D42
D46 0
D47 D44-D46
D48 D11*1950
D49 D47-D48
D50 0
D51 0
D52 @SUM(D50:D51)
D53 -------------------------
D59 @SUM(C58:C54)
D60 D52-D59
D61 -------------------------
D62 0
D63 0
D64 0
D65 0
D66 0
D67 0
D68 -------------------------
D76 0
D77 -------------------------
D78 @IF (D76>D67 THEN D76-D67 ELSE 0)
D79 D78
D81 @IF (D67>D76 THEN D67-D76 ELSE 0)
D82 =========================
D92 C90-C91
D93 -------------------------
D98 @SUM(C94:C97)
D99 -------------------------
D108 @SUM(C101:C104)+C106
D109 -------------------------
D113 @SUM(C109:C111)
D114 -------------------------
D115 0
D116 -------------------------
D117 0
D118 -------------------------
D123 C120-C121
D124 -------------------------
D125 0
D126 -------------------------
D127 @SUM(D124:D92)
D128 =========================
D130 0
D131 0
D132 0
D133 0
D134 0
D135 0
D136 0
D137 @SUM(D135:D129)
D138 -------------------------
D139 0
D140 0
D141 0
D142 0
D143 0
D144 0
D147 @SUM(C145:C146)
D148 C144-C147
D149 =========================
D151 COLUMN B
D152 Entertainment
D153 ///////////////
D154 ///////////////
D155 ///////////////
D156 ///////////////
D157 0
D158 @SUM(D153:D157)
D159 -------------------------
D160 0
D161 D158-D160
D162 @SUM(C161:D161)
D163
D164 -------------------------
D165 D158-D160
D166 0
D167 @MIN(D166:D165)
D168 @SUM(C167:D167)
D169 -------------------------
D170 D165-D167
D171 D170*0.01
D172 D170-D171
D173 @SUM(C172:D172)
D174 -------------------------
D175 VEHICLE II
D176 ___/___/___
D177 0
D178 0
D179 (D178/D177)*100
D180 0
D181 0
D182 0
D183
D184
D185
D186 0
D187 D178-D186
D188 D186*0.24
D189 D187*0.11
D190 @SUM(D188:D189)
D191 Vehicle 2
D192 0
D193 0
D194 0
D195 @SUM(D194:D192)
D196 (D195*D179)/100
D197 0
D198 @SUM(D196:D197)
D199
D200      (d)+(e)
D201 0
D202 0
D203 =========================
```

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Tech Tips

HERTZ GENERATOR

BY LARRY NOCELLA

BASIC's SOUND command gives you a range of five octaves. HERTZ.BAS uses 16-bit sound and the POKEY clock to increase this range to *nine octaves.*

Sounds and musical notes are made of sound waves. These waves have frequencies which can be measured in cycles per second, or Hertz. The pitch of a note is proportional to the frequency of its sound wave. Musicians are familiar with 440 Hertz, the frequency of the standard "Concert A." Middle C is 261.63 Hertz.

POKEY is a digital I/O chip that controls sound, among many other things. By adjusting POKEY's Audio Control register (AUDCTL) you can link together BASIC's four five-octave voices into two clearer nine-octave voices.

There is a clock in POKEY that continuously pulses to synchronize all computer functions. This clock pulses at 1,790,000 cycles per second, or 1.79 mHz (megaHertz). To generate the A at 440 Hertz, you tell your Atari to pulse every Nth clock pulse to get 440 pulses per second.

To find N, divide the number of clock pulses per second by the frequency of the note desired. For the A above, N equals 1,790,000 divided by 440, or 4068. Actually, N is approximately 4068.1818, but POKEY can't count a fraction of a pulse.

Since your Atari divides N by two before sending a sound pulse, your program must double N before using it (see line 470).

The program is simple to use. At the prompt, choose one or two voices, then type the desired frequency for each voice. Press [START] to RUN the program again and try more sounds, or press [OPTION] to end the program.

The highest frequency this program can generate is 1.79 mHz (or 1,790,000 Hertz), sending out one sound pulse for every clock pulse. Unfortunately, the human ear can only detect up to about 31,000 Hz.

The lowest sound the program generates has a frequency of 14 Hz. A lower number (13) would require a sound pulse every 68,000 clock pulses, but the 16-bit sound counter of the Atari can only go as high as 65,535 (the largest number you can represent in 16 bits).

On these super low notes, you can hear the difference between the pulses, like when you stick your tongue between your lips and blow. PLBPLBPLBT!

See Jerry White's *16-Bit Soundpower* (**Antic**, September 1985) for more ways to use 16-bit sound from BASIC.

Don't type the TYPO II Codes!

```
KV 100 REM HERTZ GENERATOR
VM 130 REM INIT
IM 140 GRAPHICS 0:LO=14
ON 150 AUDCTL=53768:CLOCK=1790000
II 160 AUDF1=53760:AUDC1=53761
RE 170 AUDF3=53764:AUDC3=53765
ZY 180 REM INIT POKEY FOR SOUND
QN 190 FOR I=0 TO 3:SOUND I,0,0,0:NEXT I
HN 200 REM COMBINE, CLOCK 1.79MHz
XX 210 POKE AUDCTL,120:? CHR$(125);
YI 220 REM EVEN VOICES = VOLUME 8
NA 230 POKE AUDC1,160:POKE AUDC1+2,168
QK 240 POKE AUDC3,160:POKE AUDC3+2,168
JX 250 REM START PROGRAM
NB 260 TRAP 260
ET 270 ? :? "One or two voices (1-2)? ";
JQ 280 INPUT #16,VOC:IF (VOC<>1) AND (VOC
   <>2) THEN 270
RB 290 TRAP 44444
KJ 300 REM MAIN LOOP
NA 310 IF VOC=1 THEN X=1:GOSUB 450:VH1=HI
   F:VL2=LOF:V1=HERTZ/2:VH3=0:VL4=0:GOTO
   340
DQ 320 IF VOC=2 THEN X=1:GOSUB 450:VH1=HI
   F:VL2=LOF:X=2:V1=HERTZ/2:GOSUB 450:VH3
   =HIF:VL4=LOF:V2=HERTZ/2
IN 330 REM MAKE SOUND
QT 340 POKE AUDF1,VH1:POKE AUDF1+2,VL2
YF 350 POKE AUDF3,VH3:POKE AUDF3+2,VL4
PR 360 ? :? :? "Voice #1 generating ";V1;
   " hertz."
GN 370 IF VOC=2 THEN ? :? "Voice #2 gener
   ating ";V2;" hertz."
KT 380 REM END PROGRAM
KP 390 ? :? "Press START to RUN again"
UC 400 ? :? "Press OPTION to end...";
JV 410 IF PEEK(53279)=6 THEN 190
IK 420 IF PEEK(53279)=3 THEN ? :? :? "END
   .":END
NE 430 GOTO 410
HW 440 REM INPUT HERTZ
CN 450 TRAP 450:? :? :? "Hertz to generat
   e ( ";LO;" - ";CLOCK;" ) ":? "for voic
   e #";X;" ->";
ZW 460 INPUT #16,HERTZ:TRAP 44444:IF (HER
   TZ<LO) OR (HERTZ>CLOCK) THEN 450
SA 470 HERTZ=HERTZ*2
JP 480 GOSUB 500:RETURN
BC 490 REM CALCULATE Nth CYCLE
VJ 500 N=INT(CLOCK/HERTZ)
GR 510 LOF=INT(N/256):HIF=N-(256*LOF)
ZF 520 RETURN
```

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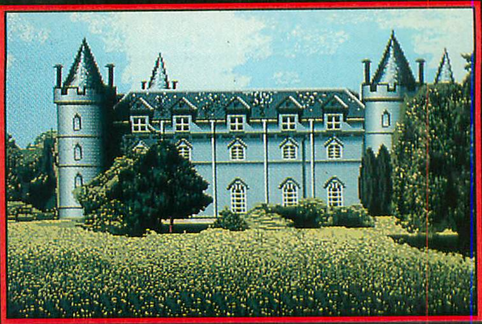
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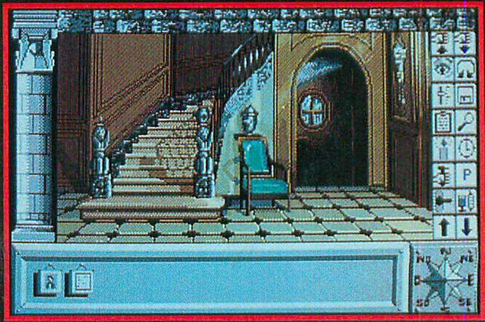
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